THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

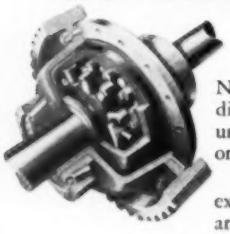
APRIL 1951

Bluff Creek sand and gravel plant of Jahncke Service, New Orleans, La.

AGRICULTURAL LIMESTONE ISSUE

Macks ARE Masters

OF THE TOUGHEST TERRAIN



No matter how tough the going... under the worst of weather conditions... through slippery mire or shifting sand... or over rutted, uneven ground — big SUPER MACK trucks keep the payloads moving on time... at less cost and with less absenteeism.

One big reason why Mack trucks lick the toughest terrain is the exclusive Mack Power Divider. Where unequal tractive requirements are encountered, the Power Divider differential distributes torque to favor the driving wheel having the most traction, thus eliminating power dissipation in useless wheel slippage.

Mack's exclusive Power Divider combines with numerous other outstanding Mack features to give you the power, strength, traction and easy maintenance so necessary for dependable, uninterrupted service on the job. Your nearest Mack branch or distributor will give you complete details. You'll find it's a story worth listening to.

In tough quarry work big Model LR SUPER MACK trucks keep the loads moving—fast.

Mack TRUCKS ... *outlast them all*

Mack Trucks, Empire State Bldg., New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

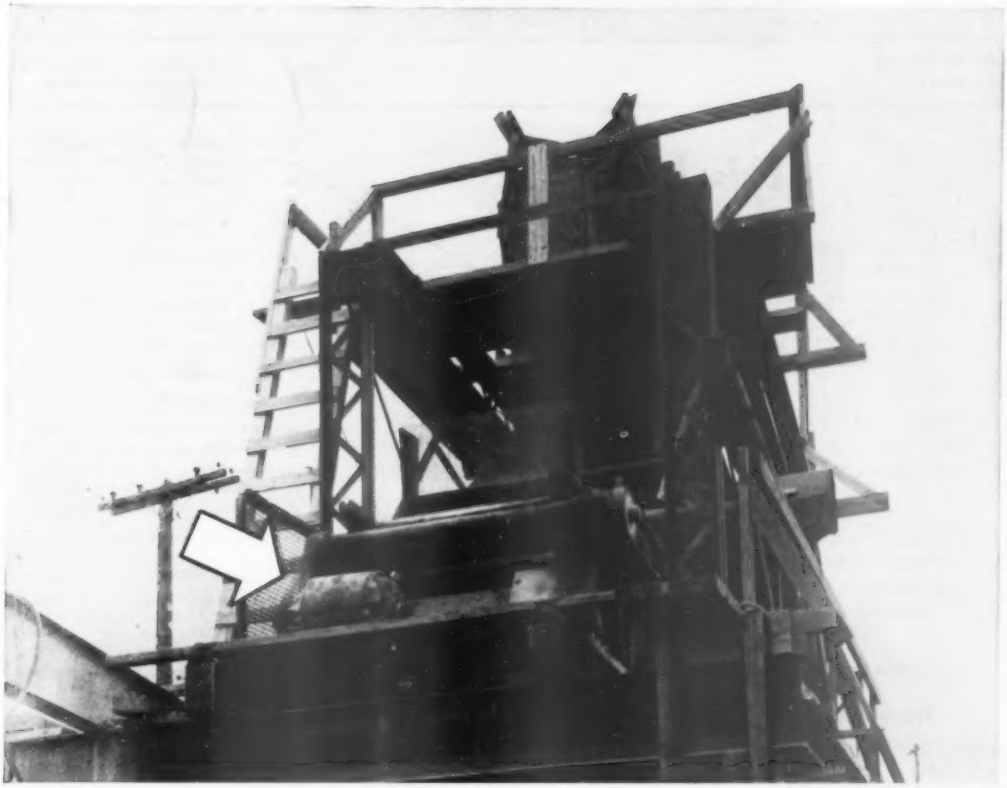


Photo courtesy M. A. Gammino Construction Co.

Where grommet V belts are outlasting others 6 to 1

B. F. Goodrich grommet V belts cut costs 20 to 50%

THOSE three V belts run a rock screen that shakes down 1000 tons of rock a day. Ordinary V belts failed in one month because the drive whips and vibrates with such terrific force that the belts came apart at the sides.

B. F. Goodrich grommet V belts were installed six months ago, show no signs of giving any trouble. Here's where that extra strength comes from:

No cord ends—A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

Concentrated cord strength—All of the cord material in a B. F. Goodrich grommet multiple-V belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. No layers of cords to rub against one another and generate heat; cord and adhesion failures are reduced.

Better grip, less slip—Because a grommet is endless, a grommet V belt is more flexible, grips the pulleys better. Size for size, grommet multiple-V belts will give ⅓ more gripping power, pull heavier loads with a higher safety factor.

Only B. F. Goodrich has the grommet!—No other multiple-V belt is a grommet V belt (U. S. Patent No. 2,233,294). Now available in C, D and E sections. See your local B. F. Goodrich distributor. Ask him to show you his "X-ray" belt that illustrates grommet construction clearly. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Grommet V Belts BY

B.F.Goodrich

RUBBER FOR INDUSTRY

APRIL, 1951

ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY

VOL. 54, No. 4

Brar Nordberg
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Nathan C. Rockwood
Editorial Consultant

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London, England—Harold F. Charles, Managing Director, Maclean-Hunter, Ltd., Sun Life of Canada Bldg., Trafalgar Square, London, S.W.I.

ROCK PRODUCTS is published monthly by MACLEAN-HUNTER Publishing Corporation, 309 West Jackson Blvd., Chicago 6, Illinois; Horace T. Hunter, President; E. R. Gauley, Vice President; J. L. Frazier, Secretary. Copyright, 1951. Entered as second-class matter, Jan. 30, 1936, at the Chicago, Ill. post office under the act of Mar. 3, 1879. Additional entry at Milwaukee, Wis. ROCK PRODUCTS is indexed regularly by Engineering Index, Inc. and the Industrial Arts Index.

SUBSCRIPTION INFORMATION

Subscription Price: United States and Possessions, Canada one year, $2.00; two years, $3.00; three years, $4.00. Pan American, one year, $4.00; two years, $7.00; three years, $10.00. All other foreign, one year, $6.00; two years, $12.00; three years, $15.00. Twenty-five cents for single copies. Canadian subscriptions and remittances may be sent in Canadian funds to ROCK PRODUCTS, P. O. Box 100, Terminal "A," Toronto, Canada.
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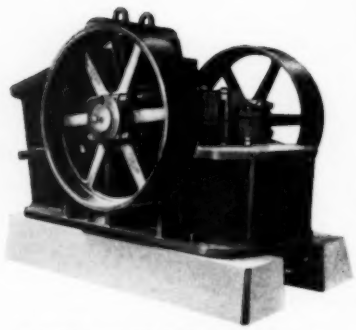
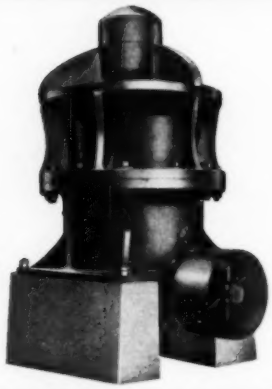
from pit to profits

It's time to "get your house in order" to meet the coming demand for more and more industrial and agricultural lime products. You will need the most modern, efficient machinery to increase production *profitably* in the face of manpower shortages and higher operating costs.

With Traylor Machinery on the job, lime production runs smoothly . . . with fewer interruptions . . . from beginning to end . . . *from pit to profits*. Get in touch with Traylor now to be sure of getting the machinery you need in time.



TRAYLOR JAW CRUSHERS for primary breaking use Traylor's smooth faced, curved jaw plates to reduce power waste . . . cut power costs. Traylor Jaw Crushers are built in 5 types with feed openings ranging from 8" x 12" up to 60" x 84". Check the coupon for literature on the one you need.



TRAYLOR REDUCTION CRUSHERS offer many outstanding advantages that reduce maintenance and operating costs. With their exclusive curved concaves and bell heads, Traylor Reduction Crushers produce an exceptionally uniform product . . . fewer waste fines. Built in 6 sizes with feed openings from 3" to 22".

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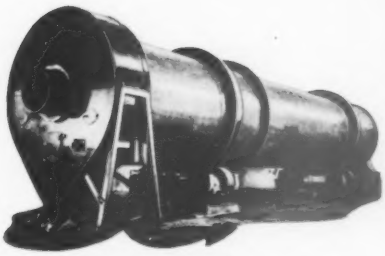
MACHINERY FOR THE LIME INDUSTRY

TRAYLOR ROTARY KILNS are extremely economical to operate. The single section rigidity of their all-welded steel shells reduces maintenance . . . makes it easier to maintain perfect alignment. Considerably less power is required to turn a properly aligned shell. Traylor Rotary Kilns are "Traylor made" for each individual installation. Check the coupon for bulletin that gives complete details.



TRAYLOR ROTARY COOLERS employ many of the same basic design principles as Traylor Kilns. Thus, they too, offer many important operating economies. Traylor Coolers are built in 4 different types. Every Traylor Rotary Cooler installation is carefully designed to meet individual requirements. For complete information, check the coupon.

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THIS COUPON will bring you up-to-date literature on any Traylor equipment in which you are interested. Each booklet gives complete details, capacities and sizes . . . shows why Traylor Machinery is more efficient . . . more economical to operate and maintain. Fill out and mail this coupon now.

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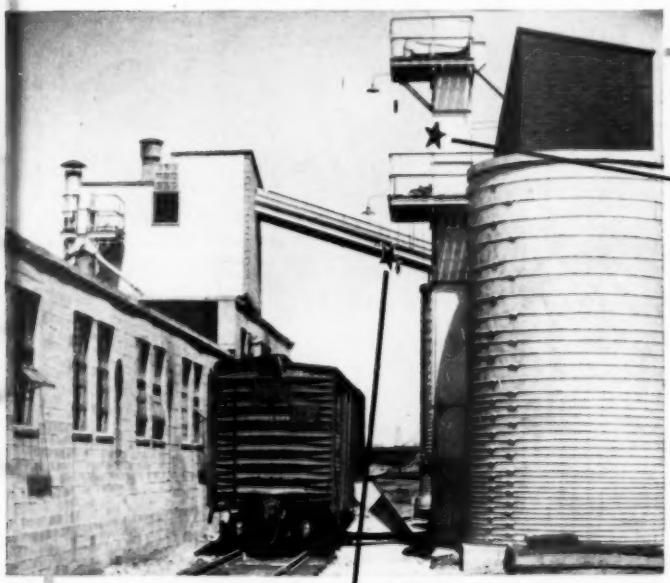
Industry's BEST SOURCE for Bucket Elevators and Screw Conveyors

LINK-BELT offers you the most diversified line of both . . . plus wide engineering experience

Get the right bucket elevators and screw conveyors for your requirements. Actually, it may be simpler than you think. For, whether your material is sticky . . . friable . . . hot . . . or abrasive — there's a Link-Belt design to move it with the highest possible efficiency.

Link-Belt builds many types and sizes of enclosed conveying equipment — the *widest range* of bucket elevators, screw conveyors and Bulk-Flo elevator-conveyors. And all are accurately made to assure smooth operation, long life.

Take advantage of Link-Belt's quality line and materials handling experience. Our engineers will be glad to help you come up with the right answers to your conveying and elevating needs.



Continuous bucket elevator delivers high capacities at lower speeds. Ideal for friable materials.

Limestone and slate granules are moved at low cost from freight cars and through processing at this Minnesota plant with Link-Belt Bucket Elevators and Screw Conveyors.

Helicoid or sectional conveyor or screws — for general screw conveyor applications — may also be furnished in the metal and finish best suited to your purpose and with components selected from the most complete line.

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LINK-BELT COMPANY: Chicago 8, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

"Washington calling!"

We were expecting this call. In a sense it is the people of America on the other end of the telephone. For some time they have been calling upon our government to take whatever steps are necessary to equip our fighting men for any job they may have to do.

Korea has proved the fallacy of limited preparedness. You know now that the nation is girding for survival. The people of America have said—and rightly—that private industry should provide the Armed Forces with whatever is necessary.

Machines are being mobilized. "Caterpillar" products are wearing olive drab once more. Because of large military demands your present machines may have to work longer than you had anticipated.

You can get many extra hours of machine service life if you:

1. **Follow a sound program of operation and maintenance.**
2. **Consult your Operator's Instruction Book, using it as a constant guide in caring for your machines.**
3. **Secure the assistance of your "Caterpillar" dealer who now, more than ever before, is your working partner for the grim job that may lie ahead.**

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Diesel Engines • Tractors • Motor Graders • Earthmoving Equipment

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Are your units in the shop more than you'd like them to be? If so, better check your lubrication set-up to help cut downtime. For lubrication is far more than just "oil and grease." It's knowledge of your machines and their exact lubrication requirements. It's use of the *right* lubricants—and knowing how to use them most effectively.

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Socony-Vacuum gives you . . .

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- Individual, tested lubrication schedules.
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1. **DELVAC OILS**—for all gasoline and automotive-Diesel engines.
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3. **MOBILGREASE**—in grades and types for proper lubrication of all chassis parts and engine accessories.

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CORRECT LUBRICATION *for Contractors*

THE FLYING RED HORSE COMPANIES: SOCONY-VACUUM OIL COMPANY, INC.
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Here's How TOURNAPULL increased

at English Chalk Mine

MAKES 11 TRIPS PER HOUR

On one-way hauls of ½ mi., the pusher-loaded 30-yd. Tournapull consistently delivers 11 heaped loads of sand and clay per hour. Cycle time averages 5.3 minutes.

This rubber-tired machine drives under its own power over both pavement and cross-country. It originally made a 35-mile trip from Staines, Middlesex, to Swanscombe through London traffic at road speeds up to 19 m.p.h.

At Swanscombe in Kent County, England, 110 ft. of sandy clay is being stripped in order to reach extensive deposits of chalk. An extra-capacity, 30-yd. B Tournapull is removing the top 50 ft. of overburden and large power shovels are digging out the bottom 60 ft.

1 TOURNAPULL replaces 3 crawlers

Until a year ago, Associated Portland Cement Manufacturers, Ltd., of Swanscombe, handled the preliminary stripping with a fleet of track-type tractors and 12-yd. scrapers. Despite 24-hour-a-day operation with these units, production was not sufficient to meet mill requirements. Also, because of the great depth of overburden involved, stripping costs were very high.

Mail today to: **R. G. LeTOURNEAU, INC., Peoria, Illinois**

LeT

Name.....Title.....

Company.....

Street.....City, State.....

Type of work to be hauled.....

☐ Please furnish more information about your BIG Tournapulls.

Also interested in:

☐ rear-dump Tournarockers

☐ bottom-dump Tournahoppers

☐ rubber-tired Tournadozer

reduced costs, stripping output

To step up output and cut operating costs, the company brought in a LeTourneau electric-control B Tournapull equipped with a 30 cu. yd. capacity scraper. It was soon evident that this big "B", working only 2 shifts, could replace 3 crawler-scraper units, working 3 shifts. As a result, 2 Tournapull operators permanently took over the work of the 12-man tractor crew.

Moves 46,667 tons per month

In 12 months of continuous operation, the Tournapull alone has loaded, hauled and dumped 560,000 tons of overburden. Enough chalk has been uncovered for 2½ *years of mining.* Before the Tournapull was put to work, stripping was never more than *two weeks'* ahead of normal mining demands, according to Works Manager Beal.

In 4500 hours, 99% efficient

In addition, Beal reports that in 4500 working hours, the big Tournapull had been down for repairs for only 24 hours. Even though sandy clay overburden has often been water-soaked (weighing 3000 lbs. per cu. yd.), the machine is still using its original scraper control cables. Total basic cost of overburden removed (including operators' wages, fuel, lubrication, and repair parts) has been reduced to only 1½c per ton.

Consider what these savings of manpower and machine units, plus a similar increase in production, could mean on your stripping operation. Your LeTourneau Distributor will be glad to show you what these large-size Tournapulls can do on work like yours. Prompt deliveries are available. Call or write him today.

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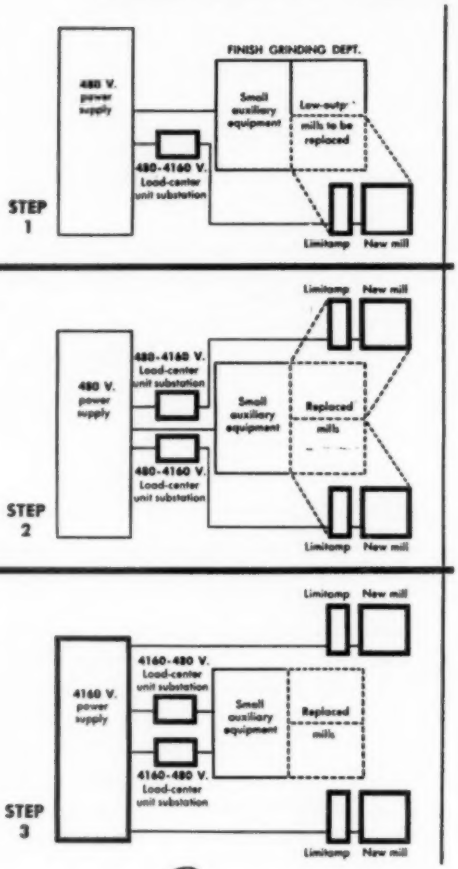
LETOURNEAU PEORIA, ILLINOIS JOB-PROVED Over 7650 Built and Shipped TOURNAPULLS

FOR LOWEST NET COST PER YARD

Now—MODERNIZE *without complete shutdown!*

CHANGE TO HIGH VOLTAGE—*step by step!*



Essential to cement-plant expansion tomorrow as well as today, electrical modernization calls for distributing power at high voltage direct to large equipment, and also to load-center unit substations where it is stepped down for small auxiliary equipment. For example, in finish grinding, here's one way many cement plants are modernizing with a minimum of production delay.

1. Replace a group of old, low-production, low-voltage mills with a new high-output mill driven by a high-voltage synchronous motor with limitamp control. Connect in reverse a load center unit substation so that the existing 480-volt supply is stepped *up* to 4160 volts for the new motor, placing the new mill in operation. The rest of the department continues to operate as before.

2. Similarly, other new high-voltage units are then added, one at a time. All equipment continues to operate from the 480-volt supply.

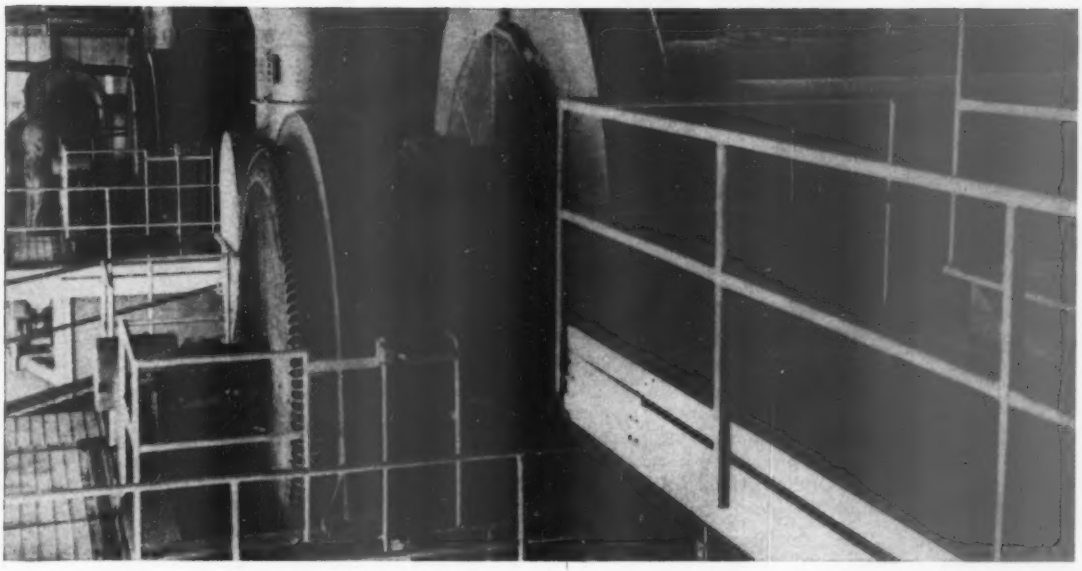
3. Replace low-voltage with high-voltage power supply by making the necessary changes at the main plant substation and in the distribution lines. (In some cases, generators used for local power will be rewound one at a time.) Connect the newly available high-voltage power direct to limitamp controllers and the high-output mills. Then reverse the load-center unit substations so that they now step *down* high-voltage to low-voltage power for small auxiliary equipment.

You can put your confidence in—

GENERAL ELECTRIC

658-5

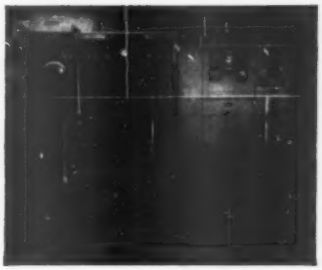
ELECTRICALLY



Increased cement production is provided by replacing several small, low-output mills with one large modern mill driven by a G-E high-voltage synchronous motor. G-E synchronous motors, high in operating efficiency for driving constant-speed cement-plant machinery, need only minimum maintenance, maintain exact speed, improve over-all plant power factor. The two G-E 1000-hp, 180 rpm, 4160-volt synchronous motors shown are driving clinker-pulverizing ball mills in the finishing department of a large Western cement plant, electrically modernized for greater output.

SIMPLIFY THE CHANGE—*with co-ordinated G-E units!*

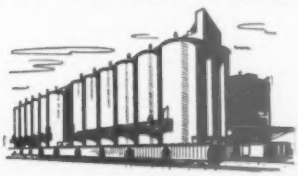
Time-and-cost-saving way to bring in purchased power to your plant is through a G-E master unit substation. All components are fully co-ordinated and metal-enclosed for personnel protection. Their flexibility makes these compact, space-saving units applicable to practically any cement-plant arrangement. The G-E master unit substation shown is 3750 kva, 66,000-4160 volts.



Complete and easy to specify, G-E load-center unit substations are assembled and wired for quick, easy installation. Standardized "building-block" design permits lower unit cost plus flexibility of arrangement to simplify plant modernization. The 1000-kva G-E unit shown supplies power to auxiliary motors in the kiln department of an electrically modernized Eastern plant.

Effective centralized control of high-voltage motors—plus sure short-circuit protection—is provided by G-E limitamp controllers which receive power direct from a master unit substation. Co-ordinated components are factory-assembled in steel cubicles, save installation time and space. The units in this modern cement plant control 1000- and 500-hp 4160-volt synchronous motors.

NOW IS THE TIME—when you are in the planning stage for modernizing your cement plant—to call in a G-E specialist to study your plant's individual needs, help you develop a plan for purchasing and modernizing on an easy, step-by-step basis. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



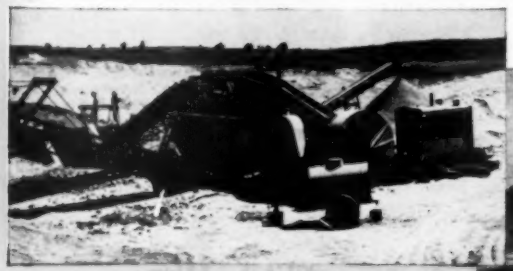
SKYWAYS

AIRPORTS are built with aggregate. Highways, dams, factories, bridges . . . practically *all* construction projects . . . begin with aggregate. But for the UNLIMITED construction that meets today's industrial and military needs, millions of tons of aggregate must be produced *at increasingly lower cost!*

Cedarapids equipment gives you the high capacity and economical operation that reduce per ton production costs . . . it assures the high quality finished products that meet exacting specifications . . . it brings you OPPORTUNITY UNLIMITED for your share of profit on future big jobs.

Whether you need single units, complete aggregate or asphalt plants, or soil compaction machines, be sure you have the best . . . see your Cedarapids distributor for the whole story.

Cedarapids
Built by IOWA
headquarters for
Quality EQUIPMENT

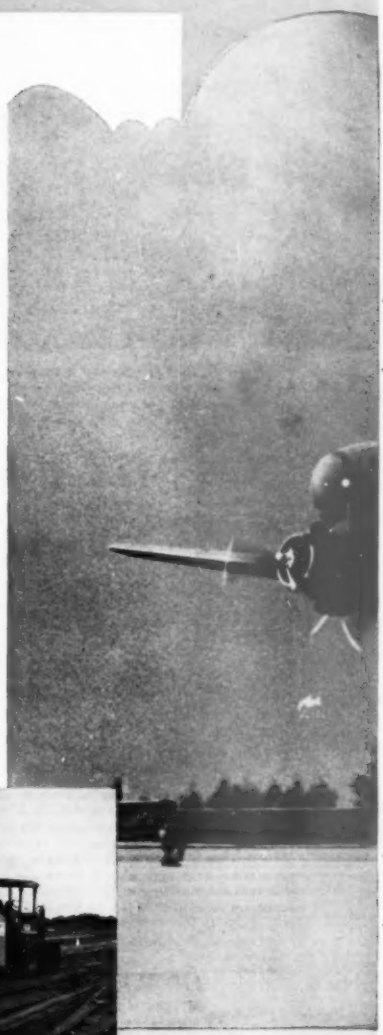


MASTER TANDEM

HERE'S the largest of the Cedarapids complete portable crushing and screening plants . . . a high capacity giant when big volume is required. For average size gravel jobs, use the Junior Tandem . . . for the smaller jobs, pick the Pitmaster. Add a Cedarapids Portable Primary and you have a rock plant. There's a size and type of Cedarapids equipment, for aggregate or black top, to meet any specification, any quantity, every pocketbook.

VIBRATORY SOIL COMPACTOR

THE Cedarapids Compactor operates on an entirely new principle...the application of controlled vibration through the pneumatic tires of a heavy roller. This powerful compacting action saves time and dollars by reaching specification densities in fewer passes.



UNLIMITED

THROUGH LOW COST AGGREGATE

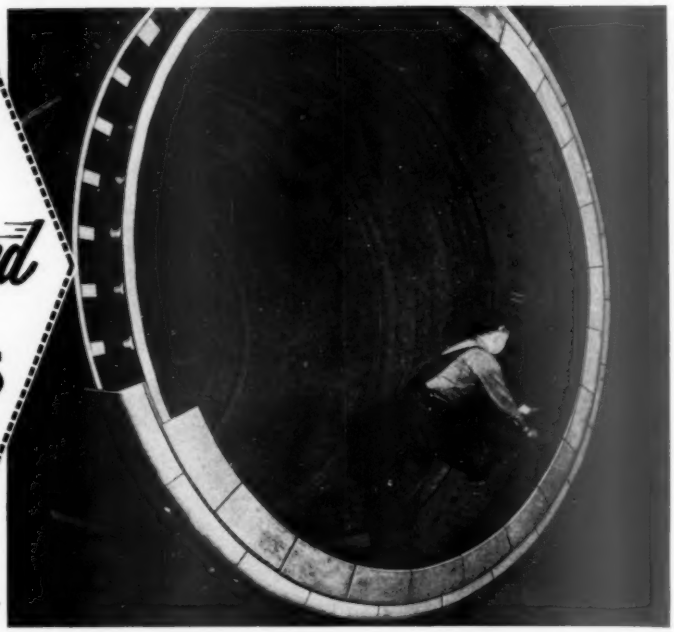
IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

THE IOWA LINE *of Material Handling Equipment Includes:* ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • DRIERS • DUST COLLECTORS HAMMERMILLS • WASHING PLANTS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

NO SHUTDOWNS
for End Brick Replacement!

WITH THIS
ALLIS-CHALMERS
Air-Cooled End
FOR
ROTARY KILNS



GET RID of nose brick troubles for good with the Allis-Chalmers air-cooled kiln end shown above. The segmental alloy steel retaining ring forms a channel through which a blast of cooling air is forced.

Result: No kiln warpage; refractory brick lasts as long at discharge end as at any point along the kiln.

This one feature alone will, during the working life of the kiln, *pay for itself several times over* in reduced downtime and increased production . . . in lower refractory costs and longer kiln life.

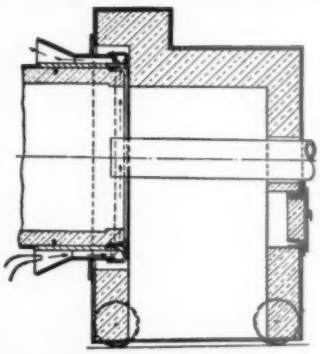
Air-cooled kiln end design makes possible the use of a more positive air seal, resulting in fuel savings.

Other important features of Allis-Chalmers rotary kilns:

- **Extra thick shell at discharge end and under riding rings.**
- **Centralized instrument control of the entire operation.**
- **Modern heat recuperation equipment. Constant delivery feeders and all auxiliary kiln equipment.**

Get more facts from the A-C representative in your area, or write for **Bulletin 07B6368.** Allis-Chalmers, Milwaukee 1, Wisconsin. A-3281

Texrope is an Allis-Chalmers trademark.



Sketch shows arrangement of movable firing hood with air-cooled kiln end.

ALLIS-CHALMERS

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Motors

Controls

Texrope Drives

Vibrating Screens

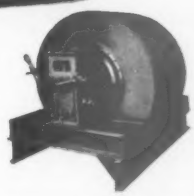
Crushers

Grinding Mills

You Can Cut Today's High Production Costs with STURTEVANT EQUIPMENT

AIR SEPARATOR

For separation of fines to 325 mesh and finer. Increases output from 25% to 300% . . . lowers power costs by 50%. For years, this separator has been the standard in the cement industry.



DUSTLESS BLENDER

Four-way mixing action assures a thoroughly blended product. Open-door accessibility permits easy cleaning. Available in many mixing capacities for ¼ ton per hour and up.

RING-ROLL MILLS

For medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operate in closed circuit with Screen or Air Separator. Open-door accessibility. Many sizes. No scrapers, plows, pushers, or shields.

SWING-SLEDGE MILLS

For coarse and medium reduction (1" to 20 mesh). Open-door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.

JAW CRUSHERS

For coarse, intermediate and fine reduction of hard or soft substances. Heavy or light duty. Cam and Roller action. Special crushers for Ferro-alloys. Several types, many sizes.

Sturtevant equipment, such as illustrated, helps you overcome high labor and production costs by increasing output. In addition, their rugged construction assures long life with minimum maintenance. It will pay you to investigate these machines. Write for information.

STURTEVANT MILL COMPANY
102 CLAYTON STREET, BOSTON 22, MASSACHUSETTS

Designers and Manufacturers of: CRUSHERS • GRINDERS • SEPARATORS
CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

MAIL COUPON TODAY!

STURTEVANT MILL COMPANY
104 Clayton Street, Boston 22, Mass.

Gentlemen:
Please send me your catalog. I am especially interested in _____

Name _____

Street _____

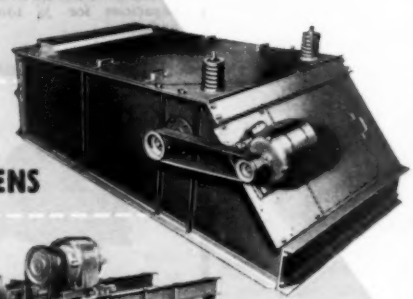
City & State _____

SYMONS SCREENS

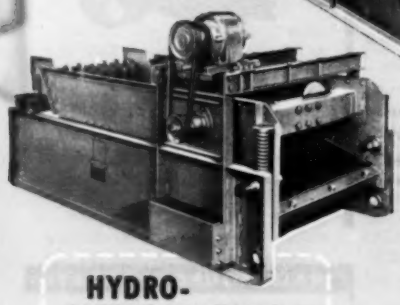
for most applications . . .

from PRIMARY SCALPING down through the FINER SEPARATIONS

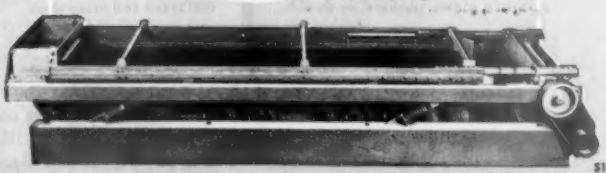
VIBRATING BAR GRIZZLIES



ROD DECK SCREENS



HYDRO-SIZER SCREENS



HORIZONTAL SCREENS

For sizing operations, Nordberg offers a broad line of Symons Vibrating Screens and Symons Vibrating Bar Grizzlies in a wide range of sizes to meet practically every problem. Here are the "highlights" of the units illustrated:

Symons Vibrating Bar Grizzly . . . for scalping coarse materials, designed to assure non-clogging action with big capacity.

Symons Rod Deck Screen . . . employs a patented screen deck, utilizing replaceable spring steel rods. Features low screening cost—big capacity—low maintenance—long life—ideal for wet and sticky materials.

Symons Hydro-Sizer Screen . . . for fine mesh, wet screening of sand, mill pulps, oil well mud, chemicals, etc.

Symons Horizontal Screen . . . unsurpassed for accurate sizing of stone, gravel, slag, coal and ores. (Fully enclosed units available for efficient "hot plant" asphalt operations). Built in a variety of deck combinations, permitting a wide range of sizes to be handled.

Write for descriptive literature covering the type of unit in which you are interested.

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN
NEW YORK • SAN FRANCISCO • WASHINGTON • SPOKANE
MEXICO, D. F. • LONDON • TORONTO • JOHANNESBURG

5151

NORDBERG

Machinery for processing ores and industrial minerals

PRIMARY CRUSHERS

SYMONS CONE CRUSHERS

ROTARY KILNS

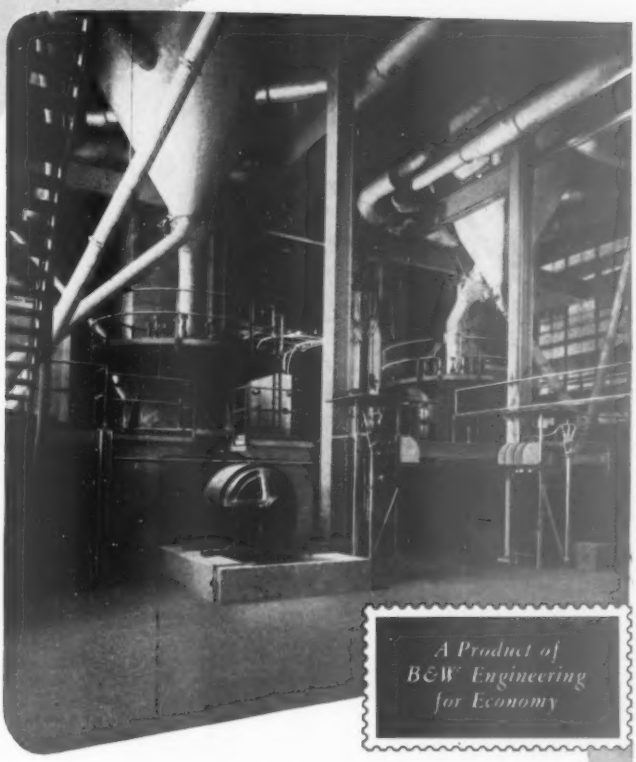
GRINDING MILLS

MINE HOISTS

DIESEL ENGINES

CHECK the COST-SAVING features of the

B&W CLOSED-CIRCUIT SYSTEM



A Product of B&W Engineering for Economy

- Limestone, shale and other raw materials are ground *and* dried automatically and simultaneously *within* the B&W Closed-Circuit System. No separate drying equipment is needed.
- Low fuel costs. With the B&W System, fuel consumption for heating drying-air is much less than with conventional methods. When oil is used, for example, consumption may be as little as 0.3 gal per ton.
- A thoroughly mixed product is assured through substantial circulating load.
- The B&W Pulverizer—heart of the B&W Closed-Circuit System—is available in sizes suitable to all capacity requirements.
- Call in a B&W engineer and find out more about this modern cost-saving system.

BABCOCK & WILCOX

C-198

For SHATTER Without SHOCK

It's Bucyrus-Erie Blast Hole Drills

EFFECTIVE SHOCK-ABSORPTION... All Bucyrus-Erie Blast Hole Drills are equipped with a rubber shock-absorber — the most effective ever devised for cushioning shocks and increasing drilling efficiency. This shock-absorber, located in the derrick head, consists of a series of tough, rubber discs between steel protectors. Rubber insulated spudding beam and heel sheaves afford further shock-absorbing action.

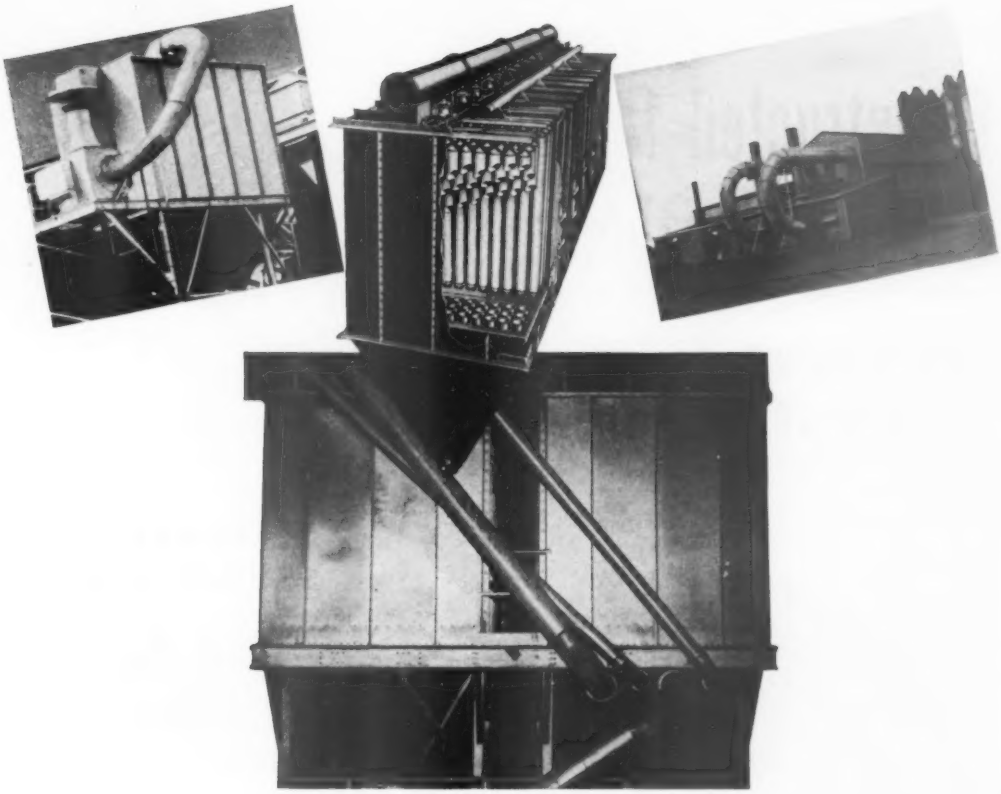
MINIMIZES MAINTENANCE... The rubber discs and the rubber insulated sheaves effectively absorb the vibrations, oscillations and shocks of drilling. This means cable wear and machine maintenance are kept at a minimum because strain on the line is reduced and peak shock loads are taken up before they can reach the main machinery.

PROVIDES SHARP, SHATTERING BLOWS... What's more, as the tools descend the compressing of the rubber discs enables the tools to travel past the point where such travel would otherwise cease. Then, the rapid expansion of the discs which occurs the instant the blow is struck snaps the tools back away from the bottom of the hole. Thus each blow is sharp and decisive, producing the greatest shattering effect.

SOUTH MILWAUKEE — BUCYRUS ERIE — WISCONSIN

30850

Find out more about the complete line of Bucyrus-Erie Blast Hole Drills — 22-T for 5⅜" to 6⅝" holes, 27-T for 6" to 6⅝" holes, the 29-T for 6" to 9" holes, and the 42-T for 9" to 12" holes.



Get A Bigger Profit From Your Dust Control

Of all the major types of dust and fume collection modern automatic bag type as developed by Norblo is the most widely useful and adaptable for heavy duty in large scale production processes. Norblo equipment is profitable to use, low in maintenance and operating cost.

Norblo bag type based on compartments of 78 cylindrical bags, progressively shaken, is adjustable for varying dust load without shutting down. The original planned efficiency of collection based on cloth area is as high as or higher than any other construction actually attained in practice.

Norblo automatic bag type dust and fume collection is fully described in Bulletin 164-2—write for it.

Norblo

Engineered Dust Collection Systems for All Industries

THE NORTHERN BLOWER COMPANY

6408 BARBERTON AVE. • CLEVELAND 2, OHIO

Constructed to Take Severe Punishment

Without Tube Swelling

CONCORD #20 STEAM HOSE

Here's the steam hose with a structural difference that eliminates . . . once and for all . . . the common failure of tube swelling under continuous high pressure operation.

CONCORD #20 Steam Hose gives you the exclusive protection of a tough inner lining . . . a lining of stainless steel wire braid. This braid assures permanent retention of the original inside hose diameter. It prevents swelling and constriction of the tube . . . assures full flow of steam at all times . . . permits re-coupling in the field when necessary, without the slightest difficulty.

In addition, CONCORD #20 construction features include: two or three braids (depending on size) of alternate high tensile steel wire and rubber layers are firmly bonded over the outside of the tube. They provide maximum burst-protection and safety. An asbestos braid provides positive cover adhesion and serves as cover insulator. On top of all is the rugged, abrasion-resistant cover that withstands the severest abuse.

Flexible, tough and dependable . . . that's BWH's new CONCORD #20! Ask your nearby BWH distributor for a demonstration. Get in touch with him today, or write us direct.

Tube Securely Locked by Special Stainless Steel Inner Wire Braid!

Illustration above shows how exclusive inner stainless steel braid of CONCORD #20 Steam Hose prevents tube swelling and assures long life under severe use.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

BWH DEPENDABLE RUGGEDNESS

HOW DID THIS QUARRY INCREASE CRUSHER BEARING LIFE 600%?

An example that shows how National Bearing Division Nickel Babbitt has reduced costs

Thirteen years ago National Bearing Division relined a crusher bearing for a Midwest quarry with N-B-M Nickel Babbitt. This babbitt alloy has exceptionally high resistance to crushing, creeping and spreading, thanks to a special method of blending developed by N-B-M Research. The method had complete follow-through in modern plants where skilled men exercise close control over every step of the foundry operation.

Result? The ordinary life expectancy of such bearings is 2 years. This bearing is still giving perfect service today — 13 years later! And it crushes hard grade rock an average of 8 hours a day, 277 days a year!

This is tremendous operating economy—and it's the direct result of a chain of action that began with National Bearing Research, coupled with N-B-M Engineering and Production skills. Add to these our strategic plant locations in major industrial centers and you have a team operation that repeats this kind of money-saving procedure throughout industry.

It's another example of how we are constantly finding new ways to lower costs and improve performance of these products used by our customers . . .

Non-Ferrous Bearings and Castings—
As-Cast or Machined

Bronze Bars—
As-Cast or Machined; Cored, Solid, Hexagon

Babbitt Metals—
For every type of bearing service

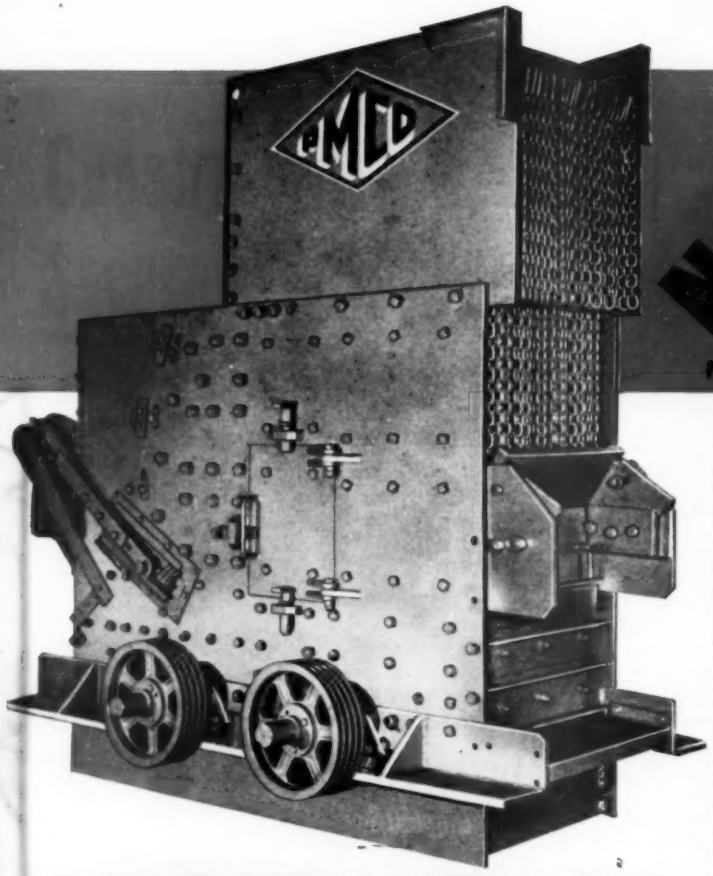
AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION
4946 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

NOW GET

MODEL 3240 IMPACT MASTER



Heavy duty construction throughout. Weighs 34,000 lbs. Gives you up to 250 tons per hour minus 2½" with 125 to 150 horsepower in average gray limestone. Produces 125 tons per hour minus 1" in many types of rock. Reduces material up to 50" long that will pass freely through its 32" wide x 40" high feed opening to specification size in one operation. Two heavy rotor hammers rotate in the same direction at speeds from 550 to 1000 rpm on 5-15/16 diameter special steel shafts. Three-way adjustment for finished product size. Available on skids, or combined with auxiliaries as complete portable or stationary units for operation in open or closed circuit.

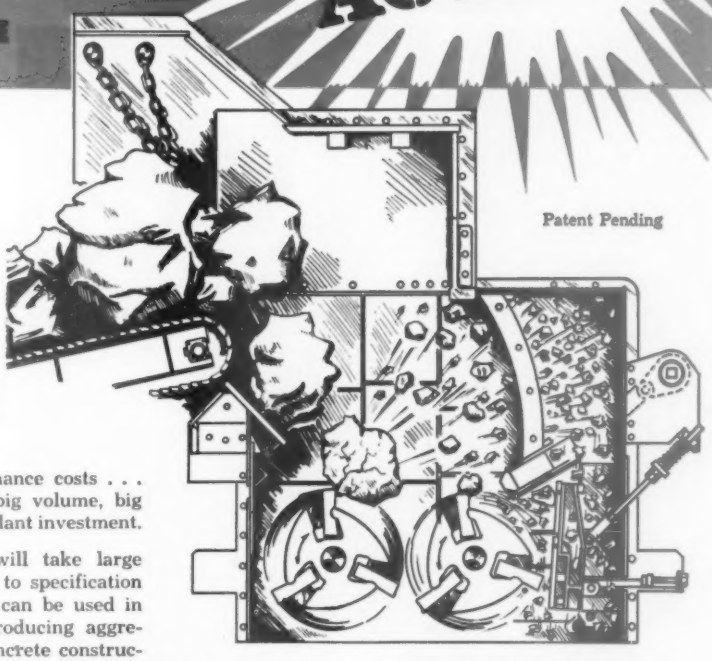
Proved Performance

Model 3240 Impact Master operating since April, 1950 in road rock - aglime setup at River Products Quarry, Iowa City, Iowa. Well over 100,000 tons of minus 2½" have been produced with no maintenance on wearing parts. Output is fed to screen with oversize going to a No. 5 Universal Hammermill.

STEP INTO BIG VOLUME, BIG PROFIT OPERATIONS AT LOWEST PLANT INVESTMENT WITH PMCO CONTROLLED IMPACT ACTION

ALL 3 WITH CONTROLLED IMPACT ACTION

PEAK TONNAGE
LOWER COSTS
BETTER QUALITY
CUBICAL AGGREGATE



Patent Pending

Controlled Impact Action

. . . . the exclusive operating principle of the PMCO Impact Master is here to give you peak tonnage of better quality finished material at lowest cost per ton. It makes possible a ratio of reduction that eliminates the need for much accessory equipment, cuts power, labor and maintenance costs . . . enables you to step into the big volume, big profit picture with a minimum plant investment.

The PMCO Impact Master will take large quarry material and reduce it to specification size in one fast operation. It can be used in open or closed circuits for producing aggregates for road building and concrete construction, and can be adjusted for the simultaneous production of aglime in profitable percentages when desired. It cuts costs in reducing many types of non-abrasive and low silica content materials, and operates at high speed efficiency in wet sticky materials that slow down production in conventional machines. Models are available with capacities up to 500 tons per hour. Investigate the PMCO Impact Master now! Get the field-proven story of Controlled Impact Action. Write for illustrated literature.

Clean, cubical aggregate is produced by the terrific impact of rigidly mounted revolving rotor hammers intercepting rock in motion. By controlling the in-fed rock and directing its flow, practically 100% of the breaking is accomplished by the rotor hammers, making it possible to better control finished product size. There is no attrition, no rubbing, no grinding. Finished material is immediately discharged from the breaking chamber. As a result you get greater capacity at lower horsepower per ton, a more uniform gradation cubical aggregate . . . . . greater finished product control.

PETTIBONE MULLIKEN CORPORATION

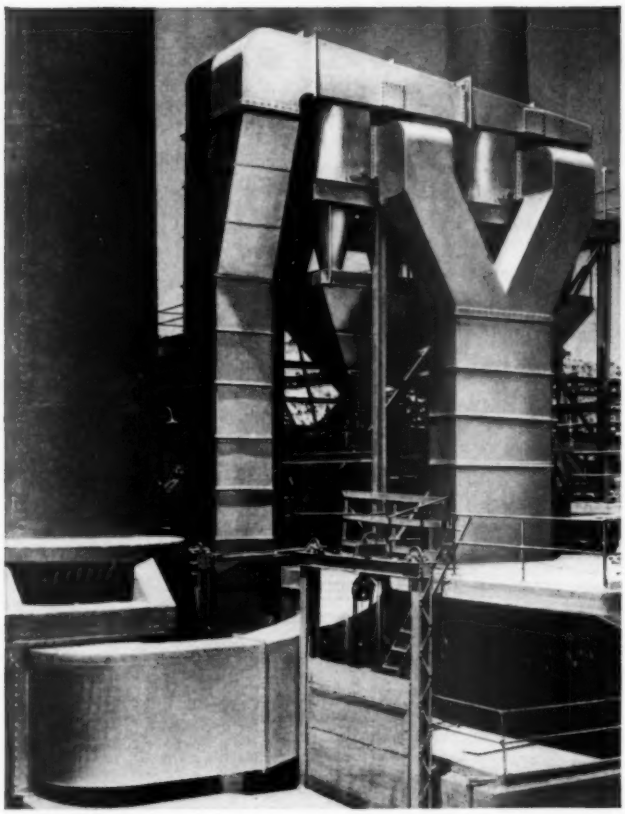
Construction Equipment Division

4700 West Division Street, Chicago 51, Illinois
Phone SPaulding 2-9300

PMCD

HAMMERMILL HAIG UNIVERSAL

Buell 'SHAVE-OFF' boosts efficiency in Kiln Dust Recovery



Cement plant engineers have long ago recognized the superiority of Buell Dust Recovery Equipment. For, only Buell Cyclones incorporate the van Tongeren 'Shave-Off' principle.

This exclusive design feature of Buell's large-diameter cyclones substantially boosts dust recovery efficiency three ways:

- Buell Cyclones recover *more dust*—with *less Alkali content*.
- Buell Cyclones can't clog. Loss from unnecessary cleaning time is out.
- Buell Cyclones virtually eliminate shutdowns and repairs by reducing abrasive effect of rock dust to an absolute minimum.

Buell engineers can show you the most economical way to efficiently recover valuable dust from pulverizers, kilns and driers. Write today for a consultation without obligation. Or ask for the Buell catalog. Buell Engineering Co., 70 Pine St., Suite 5085, New York 5, N. Y.

ELECTRIC CYCLONIC

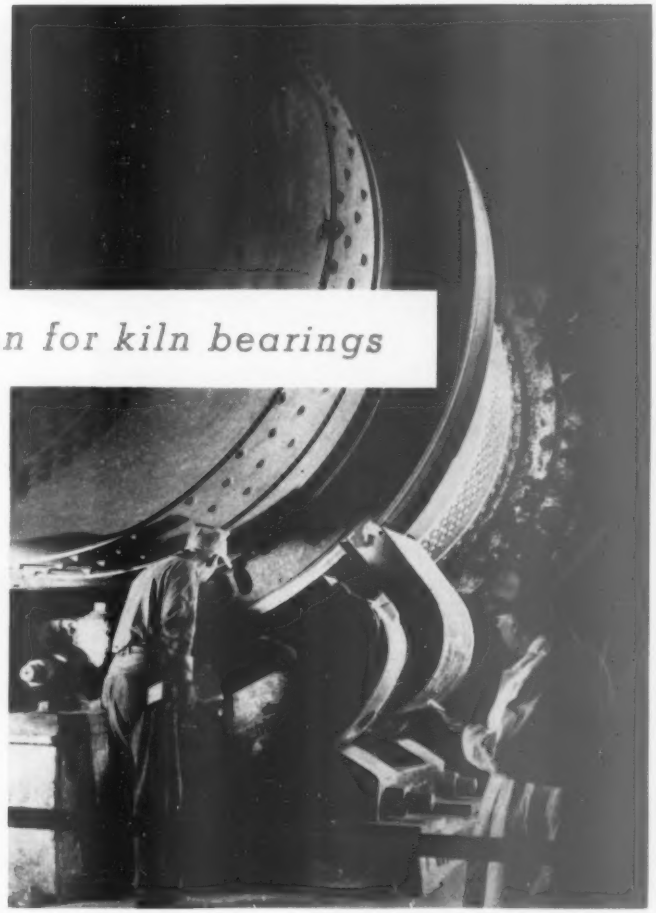
buell

Engineered Efficiency in **Dust Recovery**

Now

Better Lubrication for kiln bearings

Gulf Block Grease



Gulf Block Grease provides a new kind of lubricating performance in cement kiln bearings, and other open top plain bearings in crushers and pulverizers — keeps them operating cooler, and eliminates the need for supplemental oiling.

Gulf Block Grease is manufactured from a high quality lubricating oil and a special soap base under scientifically controlled conditions. The oil provides a protective film as soon as the shaft begins to rotate—and is released at the most economical rates over a wide range of operating conditions. It is effective at temperatures as high as 275° F. yet is not excessively hard at low operating temperatures.

It has excellent oiliness characteristics and does not glaze—which means the bearing always gets the protection of an effective friction-reducing oil film, and doesn't overheat or wipe.

Call in a Gulf Lubrication Engineer and ask him to show you how Gulf Block Grease can help you increase bearing life and reduce maintenance costs. Write, wire, or phone your nearest Gulf office today. Gulf Oil Corporation · Gulf Refining Company, Gulf Building, Pittsburgh 30, Pennsylvania.

FIFTY YEARS OF SERVICE
1901 GULF 1951
PETROLEUM AND ITS PRODUCTS

THE SPEED REDUCER THAT SAVES YOU MONEY!

Dodge

Torque-Arm

America's Most Complete Line of Shaft-Mounted Speed Reducers

- No special engineering required. No foundation to provide. No flexible couplings. No sliding base. No "lining-up" difficulties. No expensive installation. Stock TAPER-LOCK sheaves prescribed for each job to provide desired speeds. Application to other machines is practical and easy.
- Unit is driven through any V-Belt Drive. Torque-arm, fastened to any fixed object, anchors the reducer unit. Turnbuckle provides fast and accurate adjustment of belt tension.
- Backstop available from stock when required. Simple. Positive. Easily installed. Sealed inside the reducer housing.
- Compact, light weight, *rugged.* Quality built by Dodge for Dodge *dependable* service.
- Built in two series—Single and Double Reduction. Capacities from 1 to 27 h. p. Speeds from 12 to 330 rpm. Available from distributors' stocks.
- WRITE for special bulletin A602.

DODGE MANUFACTURING CORPORATION, 2600 Union Street, Mishawaka, Indiana

DODGE
of Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new cost-saving methods. Look for his name under "Power Transmission Equipment" in classified phone book.

FIRST IN POWER TRANSMISSION MACHINERY!

V-BELTS AND TAPER-LOCK SHEAVES

DODGE-TIMKEN PILLOW BLOCKS

ROLLING GRIP AND DIAMOND B CLUTCHES

SOLID STEEL CONVEYOR PULLEYS

ALLIS-CHALMERS Sets New Standards

for Tractor Performance
for Lasting Durability
for Simplified Servicing
for Ease of Operation

. . . THE NEWEST, FINEST TRACTOR LINE ON EARTH

model **HD-20**
Hydraulic Torque Converter Drive
175 net engine hp.
41,800 lb.

model **HD-15**
102 drawbar hp.
27,500 lb.

model **HD-9**
70 drawbar hp.
18,500 lb.

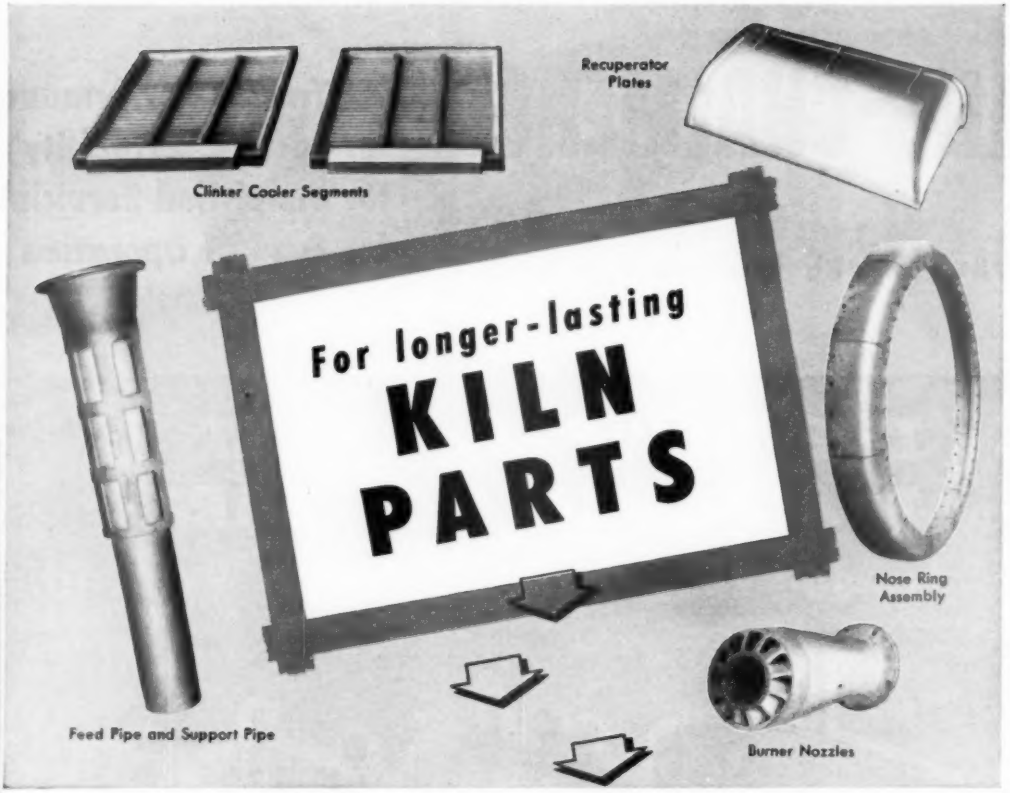
model **HD-5**
40.26 drawbar hp.
11,250 lb.

Get the full story from your Allis-Chalmers dealer.
See these tractors perform. They're built for YOUR job!

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Originator of the Torque Converter Tractor



Other Thermalloy Uses in the Cement Industry

- Chain, conveyor, clinker, drag
- Cooler lifters, spouts, grating, side plates
- Dampers
- Kiln end rings, feed chutes, hangers
- Kiln shell segments
- Slurry feed pipes

Investigate THERMALLOY*

Thermalloy has proved in hundreds of kiln installations that it can take heavy loads and rough usage... resist corrosive gases, excessive heat (up to 2100°F) and abrasives.

Thermalloy is not just one alloy. It is a *group* of alloys, each developed to meet a specific heat and abrasion problem.

An Electro-Alloys engineer can show you how Thermalloy kiln parts can give you *lower operating costs per hour* . . . assist you in selecting the design best suited to your needs. Call your nearest Electro-Alloys office, or write Electro-Alloys Division, 2142 Taylor Street, Elyria, Ohio.

*Reg. U. S. Pat. Off.

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION
ELYRIA, OHIO

Speed Trucks in "Stop and Go" Traffic

The steady increase in traffic volume is of growing concern to truck operators. Unless trucks can keep pace with the flow of cars, schedules are slowed down and operating costs rise expensively.

Eaton 2-Speed Axles help truck owners solve this problem. Their vehicles have twice the conventional number of gear ratios. That means they can use a "low" gear for quick pick-up under full load. It means easier maneuvering in tight spots. It means climbing most hills faster. It means highballing on the open road. These advantages also result in operating economies—fewer stops for gas and oil—less time in the shop, because engines and all power transmitting parts last longer.

Your dealer will be happy to explain the value of Eaton 2-Speed Axles and tell you how Eaton's exclusive planetary gearing and positive lubrication assure long axle life.

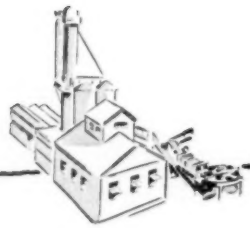
EATON
2-Speed Truck
AXLES

Axle Division

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS



New tools for sand producers

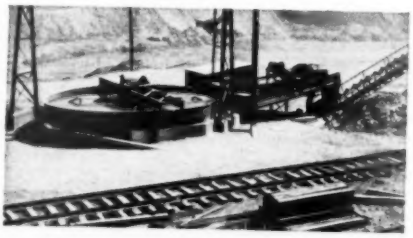
Is the fine sand you are losing in the overflow from your present washing equipment worth recovering? Chances are it is . . . and Dorr has two practical approaches to the problem. Your particular conditions and requirements will determine which is better.

Better tools TODAY... to meet tomorrow's demand.

The DorrClone

(Dutch State Mines Cyclone)

The DorrClone* is a high capacity unit utilizing centrifugal force in place of gravity. It is ideal where space is limited . . . installation is simple . . . requires practically no support other than that necessary for piping. Automatic density controls can be supplied which insure a virtually constant density of discharge regardless of variations in feed. Single 24 inch units can handle from 500 to 1000 gallons per minute, depending on inlet pressure and mesh of separation.



The Dorrco Bowl Desiltor

The Dorrco Bowl Desiltor* is a modified Bowl Classifier combining big settling area with relatively small raking capacity. Power and maintenance requirements are extremely low. Minus 100 mesh sand is recovered as a low moisture rake product for conveyors or stockpiling.

LOST SAND IS LOST PROFIT. *Why not check the advantages of these units against your requirements? Address inquiries to The Dorr Company, Barry Place, Stamford, Conn. or, in Canada, to The Dorr Company, Engineers, 80 Richmond Street West, Toronto 1.*

*DorrClone and Desiltor are trademarks of The Dorr Company.

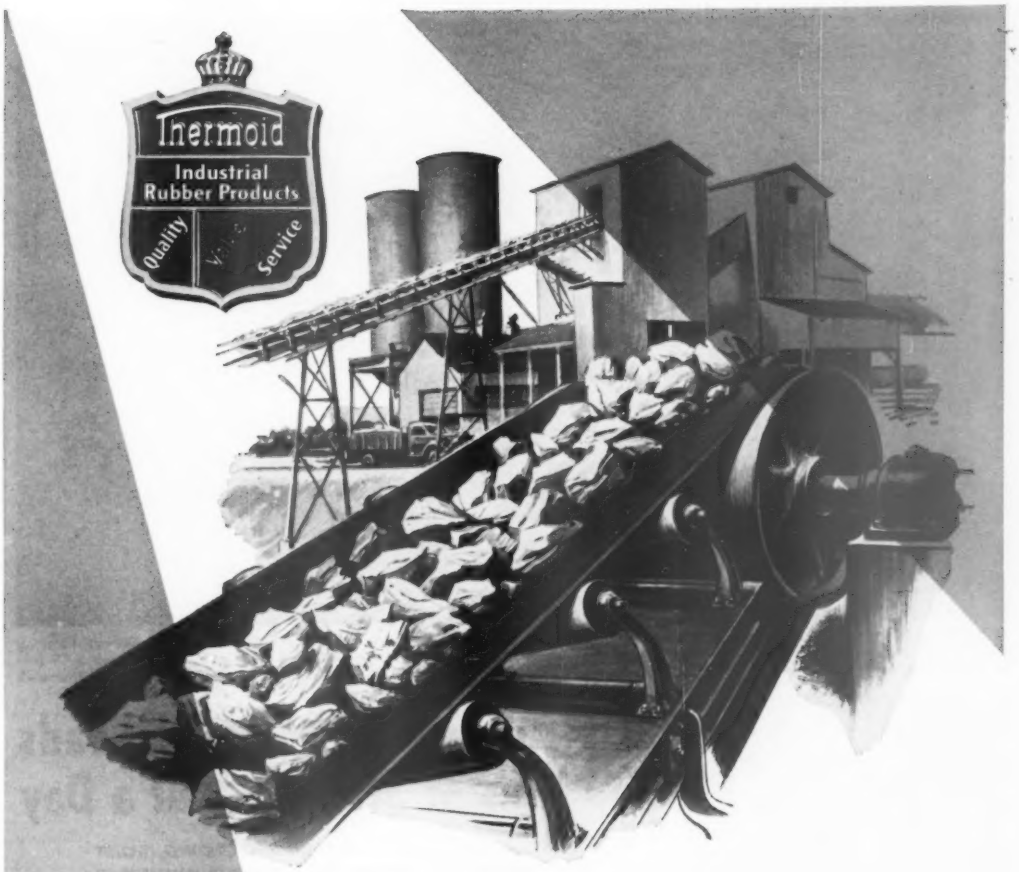
DORRCO

DORR

WORLD-WIDE RESEARCH · ENGINEERING · EQUIPMENT

THE DORR COMPANY · ENGINEERS · STAMFORD, CONN.

Associated Companies and Representatives in the principal cities of the world

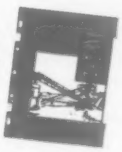


"Whatever Your Conveyor Belting Problem . . . *Thermoid Has The Answer*"

Whatever the job—whatever the nature of the materials to be handled—heavy or light, soft or abrasive, hot or cold, wet or dry, uniform or non-uniform in size—there is a Thermoid belt built to do the job at the lowest cost per ton of material handled.

Thermoid belts are made with an extra margin of endurance. You will find they stay on the job long after ordinary belts fail. With Thermoid, you will have fewer delays due to belt breakage or premature wear. Your Thermoid distributor will be glad to help you with your requirements.

Here's The Book That Will Answer Many Of Your Questions



Drop us a line for your free copy of Book No. 3679. It is a handy reference guide, concise and complete. 16 pages of valuable charts, tables and graphs tell how to select the right conveyor or elevator belt for the materials to be handled . . . how to determine capacities, speeds, weights and number of plies.

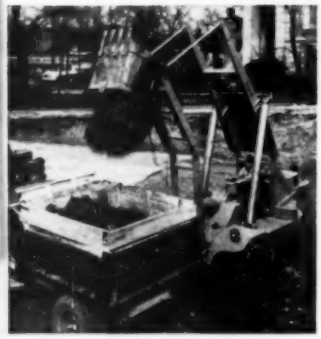
Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

THE DEMPSTER-DIGGSTER, Type GRD, same as the one that loaded 600 tons of stone recently, has a 15 foot six inch turning radius, is 20 feet long when bucket is in traveling position, and bottom of bucket is nine feet three inches above ground when in extreme dumping position. It will dig 15 inches below grade and through a 15 foot bank. Note how bucket follows the slope of the material.



THIS DEMPSTER-DIGGSTER, Type HL, is specially equipped for high dumping. The bottom of the bucket is 13 feet six inches above ground. It will dig through an 18 foot bank.

FOR FAST, EFFICIENT operation in difficult terrain, the Dempster-Diggster is available with crawler-type traction.

Fast Automotive Shovel Loads 600 Tons of Stone in Half a Day

CONTRACTOR REPORTS: HYDRAULIC CROWD, HOIST UNIT "FILLS LONG NEEDED PLACE IN OUR INDUSTRY"

THE DEMPSTER-DIGGSTER, a revolutionary shovel loader, recently loaded 600 tons of broken stone in the first half day of operation. This outstanding performance was reported to Dempster Brothers, Inc. by W. E. Lambert, president of Lambert Brothers, Inc., one of the nation's largest crushed stone contracting firms.

"In connection with our extensive activities in several southern states," the contractor said, "we have used various types of power shovels and front end loaders. After seeing the easy operation of the hydraulically operated Diggster in a demonstration we had made alongside of a competing loader, we placed an order with you. We installed the Diggster equipped with a yard and half stockpile bucket on one of our operations in western North Carolina.

"Our records show," he continued, "that the unit loaded approximately 600 tons of broken stone in the first half day of operation. The Diggster has been working continuously and is giving perfect satisfaction. It is a pleasure for us to so advise you because in our opinion the Diggster fills a long needed place in our industry. We welcome you to bring any interested parties to our operation to see the Diggster in action."

The tremendous speed of the Dempster-Diggster in excavation and stockpile work is accounted for, mainly, by its exclusive independent hydraulic crowd and hoist action, the hydraulic steering, and wheel-type traction, which permits truck speeds to and from jobs. The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver easy, fast, finger-tip control.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and 1¼ cubic yard (heaped) capacities; materials handling buckets in 1½ and 2 cubic yard (struck) capacities.

Complete information and prices may be obtained by writing the manufacturer, Dempster Brothers, Inc.

DEMPSTER DIGGSTER

DEMPSTER BROTHERS

341 N. Knox
Knoxville 17, Tennessee

Considering there are 7 Bemis Multiwall Plants . . . and 36 sales offices . . . and a small army of Bemis factory representatives and salesmen . . .

You see why so many multiwall users depend on Bemis for bags and all kinds of packaging service. You can't beat the combination of quality and experience.

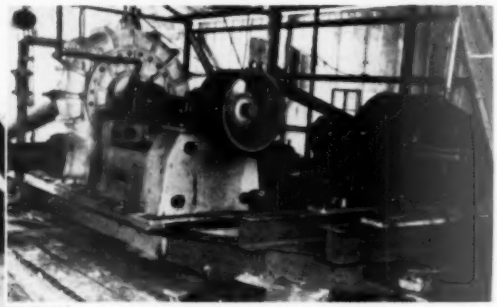
BEMIS BRO BAG COMPANY

Bemis

Bemis—an American enterprise in business since 1858 . . . employing 10,000 men and women in 45 plants, mills and sales offices . . . in 28 states, coast to coast.

"We PROFITED by Converting to Thomas Pumps"

Says A. G. Collins, Manager, American Sand & Gravel Company, Hattiesburg, Mississippi.



Above: Twelve-inch Thomas Durable Pump operating on 12-inch pipe line shown at left.

Left: Foreground shows 12-inch pipe line from Thomas Durable Pump to screening plant on shore. In front of screening plant, is 8-inch Thomas Pump serving loading plant of American Sand & Gravel Company, Hattiesburg, Mississippi.

MODERN DESIGN PLUS MODERN MATERIALS EQUAL LOWER PUMPING COSTS

Mr. Collins Writes:

"Our 8-inch Thomas pump, which replaced a cast iron pump 14 months ago, loads about one-third more material than we did previously in a given time, our power unit is not overloaded as it was before, and Thomas pump parts outlast those in our previous pumps by 5 or 6 times."

★ ★ ★

"Our 12-inch Thomas pump replaced a manganese steel pump and gives us 3 to 4 times more wear than the unit replaced. Our downtime has decreased to almost nothing."

★ ★ ★

"We are now installing a 6-inch Thomas pump to replace our last manganese steel pump. We have profited considerably by converting our entire operation to Thomas pumps."

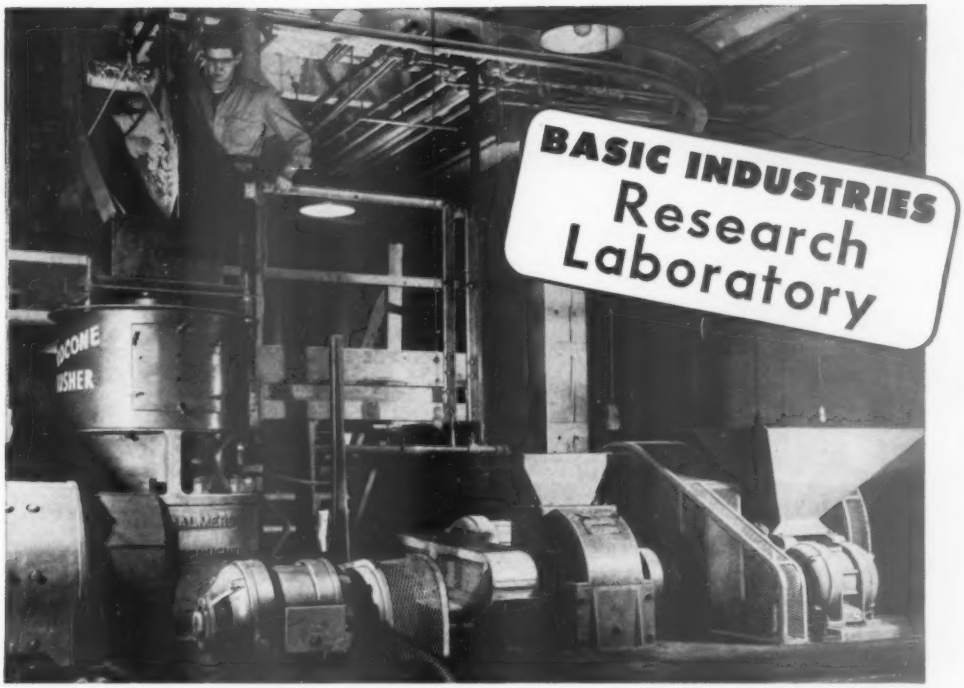
This Thomas Durable Pump user is making a "clean sweep" of his old pump equipment. Within about one year, he has replaced three ordinary, conventional pumps with Thomas Durable Pumps.

The service life of his Thomas Durable Pumps is 3 to 6 times greater than the other pumps he has been using. He is moving more material, at reduced power consumption, reduced downtime and reduced over-all operating costs.

If you are interested, not in first cost of a pump, but in reduced cost per yard or per ton of material handled, write for illustrated circular on Thomas Durable Pump.

THOMAS FOUNDRIES INC.

BIRMINGHAM 1, ALA.



Can You Use These Facilities?

THE ALLIS-CHALMERS Basic Industries Research Laboratory is open for business — to help you work out profitable solutions to processing problems. It contains modern equipment for both batch and pilot mill tests in grinding, crushing, sizing, concentrating, jigging, pyro-processing, as well as chemical and physical analysis.

The Laboratory's purpose is to develop new or more efficient processing methods . . . to determine the economics of a process prior to full scale production . . . to provide engineering information to guide in the designing of efficient plants.

Use of the facilities of the laboratory are available to anyone in industry. Charges are based on costs. Estimates for test work can be obtained from the A-C district office in your area or by writing direct to Allis-Chalmers Research Laboratory, Milwaukee 1, Wisconsin.

HERE'S HOW LABORATORY SERVICE WORKS:

A manufacturer of rock products wanted to crush and grind a granite rock to produce material for roofing granules.

A considerable amount of equipment would be required, and before making this expenditure the company wanted to be sure that not too much material would be lost as fines in the process. It was estimated that a 50 percent recovery would be commercially practical.

The problem was brought to the Allis-Chalmers Basic Industries Laboratory for crushing and grinding tests. A ton of the granite rock was run through the Laboratory's pilot mill and a flow sheet was worked out which resulted in 70 percent recovery of finished product.

As a result of the tests, this manufacturer was able to proceed with confidence in setting up new equipment . . . with only a nominal expenditure for preliminary pilot plant testing.

ALLIS-CHALMERS

Basic Industries Research Laboratory — Dedicated to a Better Utilization of our Raw Materials

Free

Write Allis-Chalmers, Milwaukee 1, Wis., for Bulletin 07B6419B.

Name .....

Company .....

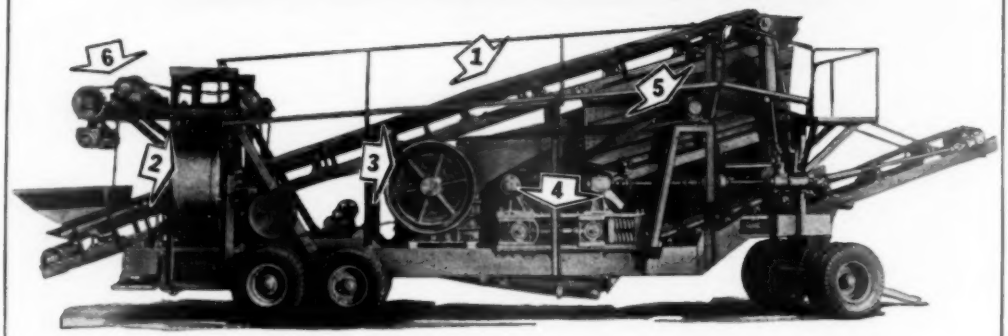
Position .....

Address .....

City ..... State .....

A-3338

6 reasons..



DIAMOND

"95" Portable ROTOR-LIFT PLANTS Produce . . . More Aggregate . . with Less Down Time . . at LOWER COST!

1. **Straight line principle** of flow—without extra scalpers—means more material—faster—at less cost.
2. **Rotor-Lift** transfers material from under-crusher conveyor to feed conveyor which returns it to screen for re-screening. Material is spread evenly on feed conveyor—without batching or bunching—eliminating screen overload.
3. **"Double Impact" Primary Jaw Crusher** delivers greater tonnage of crushed material—per-square foot of jaw area—to screens and conveyors.
4. **Secondary Roll Crusher** steps up plant output by eliminating reruns through primary jaw crusher.
5. **Balanced Vibrating Screen** with longitudinal center and center of balance on same line gives even material distribution over screen surface.
6. **Swivel Drive** delivers power to swivel field conveyor—permits loading from large pit area without moving plant.

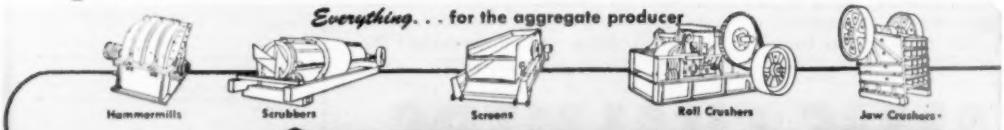
DIAMOND "95" ROTOR-LIFT PLANTS GIVE . . .

Higher Capacity • More Uniform Crushing • Uninterrupted Flow of Material • Higher Production • Lower Cost Per Ton

DIAMOND PORTABLE PRIMARY CRUSHING PLANTS handle breaking of extra large rock for feeding to crushing and screening operations that follow. Portable Primary Plants include five standard sizes with 15x24, 15x36, 20x36, 24x36, and 30x42 Jaw Crushers.

YOUR DIAMOND REPRESENTATIVE will give you the complete "Line-Flo" story . . . the straight line flow design which gives greater aggregate production. **Write Dept. F for Bulletin D-48-A.**

Everything. . . **for the aggregate producer**



DIAMOND

DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIV.
1766 N. 2ND STREET, MINNEAPOLIS 11, MINNESOTA

The JOY CHAMPION BLAST HOLE DRILL

CUTS YOUR DRILLING COSTS TO A FRACTION!

There's nothing in the field to touch the Joy Champion! Users will tell you—it actually out-drills three or more churn drills; gives you longer bit life, too. Drills *dry*—no water lines to lay, no winter freezing problems. You finish every hole started—straight, smooth-walled holes that load easier and shoot more efficiently. Two models: Heavyweight and Middleweight Champions—choice of diesel or electric drive. ● *Get a performance estimate—send us samples of your rock.*

WBD R3471

Consult a Joy Engineer

100 YEARS OF ENGINEERING LEADERSHIP

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

SILICA FLINT

CLASSIFY ABRASIVES with

QUARTZ FELDSPAR

RAYMOND
Double Whizzer
SEPARATOR

Showing standard construction for long and satisfactory service handling normally abrasive materials

Special abrasion-resistant Raymond Separators do an outstanding job in classifying highly abrasive materials, such as flint, feldspar, quartz and silica sand.

These Separators are specially built for unusually hard service. Whizzer blades and whizzer cones are built of abrasion-resistant alloy castings. In addition, the unit is completely lined internally with replaceable steel plate liners.

As a result, Raymond Separators show substantial savings in terms of greatly reduced repair expense, and much longer runs without shut-down. Per ton costs are greatly reduced.

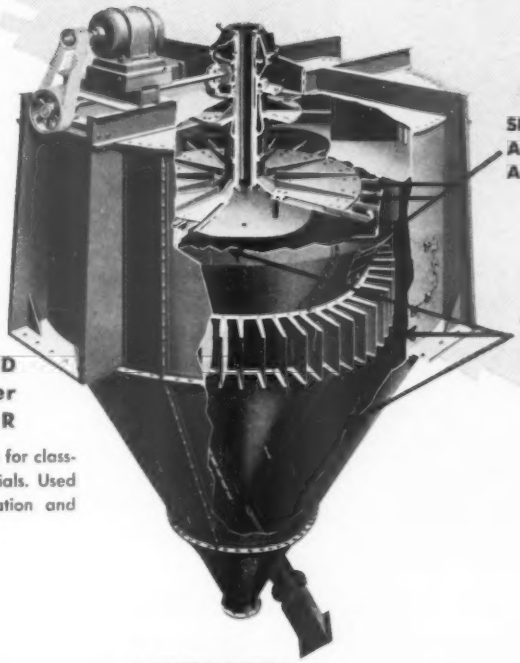
Raymond Mechanical Air Separators are available with Single or Double Whizzer, and in commercial sizes from 4′0″ to 18′0″ in diameter —also a 30-Inch Separator and 10-Inch Laboratory Separator. Whatever material you are handling it pays to specify Raymond Separators for economical performance.

COMBUSTION ENGINEERING

RAYMOND PULVERIZER DIVISION

1307 North Branch Street Chicago 22, Ill.

RAYMOND *WHIZZER* SEPARATORS



SPECIAL
ABRASION RESISTANT
ALLOY CASTINGS

COMPLETELY LINED
INTERNALLY

RAYMOND
Single Whizzer
SEPARATOR

Showing Special construction for classifying highly abrasive materials. Used for medium fineness separation and for dedusting operations.

TYPICAL PRODUCTS

- SILICA SAND*
- SILICATE MATERIALS*
- CEMENT CLINKER
- CEMENT RAW MIX
- HYDRATED LIME
- GYPSUM
- FLINT*
- FELDSPAR*
- QUARTZ*

*Indicates materials for which special construction is recommended.

-SUPERHEATER, INC.

Sales Offices in

Principal Cities

SINCE 1917

To Give You Bigger Performance This ¾ Yard Bay City Is

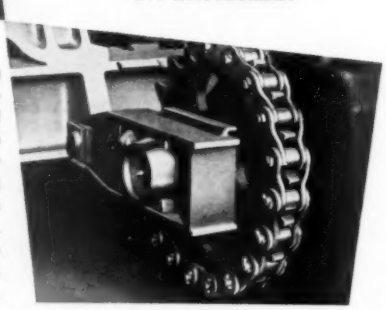
BUILT TO BIG MACHINE PROPORTIONS

When you're in the market for a ¾ yard machine . . . look at the BAY CITY. You'll find one working near you and you'll find it to be a bigger ¾ yard machine that will give you bigger performance because it is built to big machine proportions. Power packed and nicely balanced, the Model 45 has a crane rating of 14 tons and weighs 22 tons as a shovel. It is fast and sturdy to give you that extra value which means larger profit possibilities. Why not write us for latest catalog or see your nearest BAY CITY dealer.

BAY CITY SHOVELS, INC.
BAY CITY, MICHIGAN

CHECK LIST
- Fully Convertible
- Long, Wide Crawlers
- Alloy Cast Bases
- Tandem Drums
- Power Booster Clutches
- High Line Speeds
- Wide Vision Cab
- Pin-Connected Boom

The outboard bearing assembly — a standard BAY CITY design feature — is pivoted to the H-beam axle and provides a third bearing for the crawler drive shaft. A short, sturdy adjusting bolt, locked in position, is in compression at all times and is shielded by a grease filled pocket. Forged adjusting boxes have bronze bearings arranged with grease pockets which prevents entrance of dirt.



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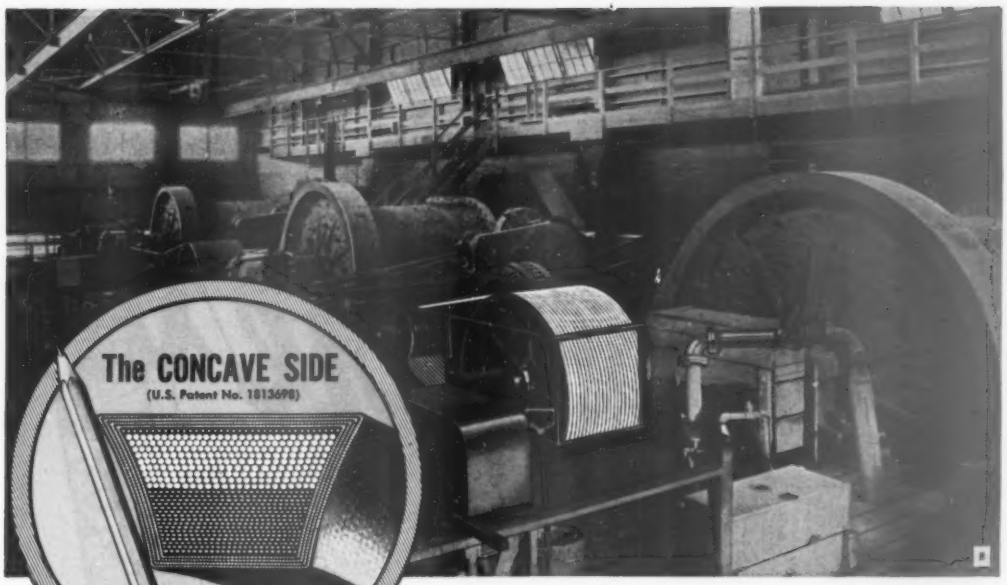
BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS



Bagdad Copper Corporation's Arizona plant chose Gates Vulco Rope Drives for these big Ball Mills because of the proven ability of Gates Vulco-Ropes to handle this rugged service.

This Simple Test Tells WHY the Concave Sides of Gates Vulco Ropes Mean *Longer Belt Life!*

Prove this *yourself*—in two minutes' time.

Take any V-belt that has *straight* sides. *Bend* that V-belt while you grip its sides between your fingers and your thumb. You will *feel* the sides of the belt *bulge out*—as shown in figure 1-A, below.

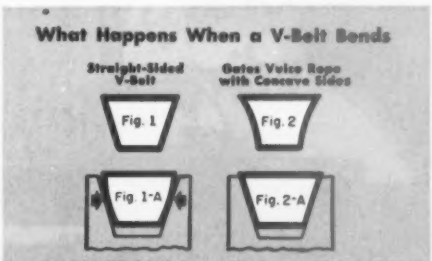
Clearly, that outbulge forces the sides of the belt to press *unevenly* against the V-pulley—and this concentrates the *wear* where the bulge is greatest.

Now, make the same test with the belt that is built with the Concave Sides—the Gates Vulco Rope.

Figures 2 and 2-A show clearly what happens when you bend a Vulco Rope. Instead of *bulging*, the precisely engineered Concave Sides merely *fill out* and become perfectly straight. There is no side-bulge. This belt, when bent, precisely fits its sheave groove.

Because there is *no bulging*, the sides of the Gates Vulco Rope always grip the *full* face of the V-pulley *evenly* and therefore wear *uniformly*—resulting in *longer belt life* and *lower belt costs for you.*

Only V-belts made by Gates are built with concave sides. Whenever you buy V-belts, be sure that you get the V-belt with the Concave Sides—The Gates Vulco Rope!

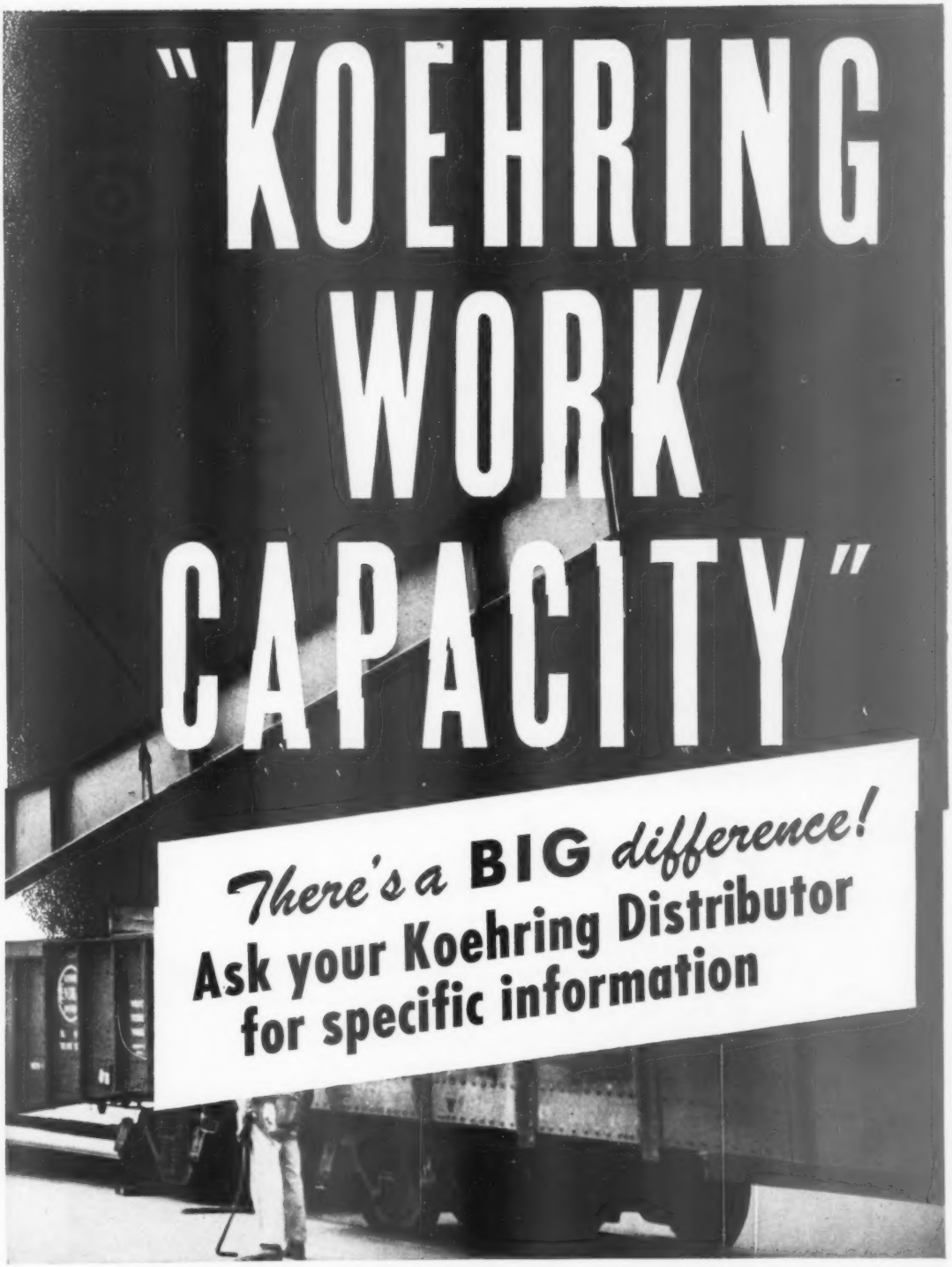

What Happens When a V-Belt Bends
Straight-Sided V-Belt
Gates Vulco Rope with Concave Sides
Fig. 1
Fig. 2
Fig. 1-A
Fig. 2-A
How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.
The Concave Sides Fill Out to a Precise Fit in the Sheave-Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

CS-511

THE GATES RUBBER COMPANY
DENVER, U. S. A.
The World's Largest Makers of V-Belts

Gates VULCO ROPE DRIVES
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

304
KOEHRING
HEAVY DUTY
KOEHRING COMPANY
Milwaukee 16, Wis.
K46
Subsidiaries: KWIK-MIX • JOHNSON • PARSONS


"KOEHRING
WORK
CAPACITY"
There's a BIG difference!
Ask your Koehring Distributor
for specific information

WIRE
COUNTERED
PRIMACORD
Easy to Handle and Hook Up
Three Types of Primacord
WIRE COUNTERED PRIMACORD
Wire Countered Primacord is armored with closely stranded brass wire. This wire countering has 2 important advantages:
1. The wires increase the tensile strength of the Primacord to 220 pounds.
2. The wires resist abrasion: protect the Primacord during loading operations, or when it is used in ragged holes.
For these reasons, Wire Countered Primacord is recommended for use as down lines when the going gets rough.
Easy to Handle and Hook Up

is in the picture when the going gets *Rough*

Armored to resist highly abrasive conditions, Wire Countered Primacord is recommended for use as *down* lines in deep, ragged holes. The wire countering increases the tensile strength of the Primacord, and gives it added protection during loading operations.

The four grades of Primacord enable the blaster to meet every condition encountered in coal stripping, open-pit mining, quarrying, pipe-line river crossing, marine work, coyote tunnels, etc. Flexible, easy to hook up and handle, waterproof and insensitive to stray electrical currents, Primacord is the ideal detonating agent — the modern way to better output, greater economy.

Ask for a copy of the new Primacord Book.

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut P-52

Also Ensign-Bickford Safety Fuse — Since 1836

PRIMACORD-BICKFORD Detonating •Fuse•

Where the Diggin's Tough

HARD FACE WITH WEAR-ARC

After hard facing with WEAR-ARC 12, this bucket has seen many months of tough service digging blue stone, without appreciable wear from abrasion or impact.

Increase the life of your Equipment Many Times
Use Wear-Arc against Abrasion, Impact, Corrosion

Bucket and shovel tooth life is increased many times by welding wedge bars to worn tooth point with WEAR-ARC WH and hard facing with WEAR-ARC 12 electrodes.

To reclaim worn equipment and hard face against excessive wear, you will find one, or a combination of two, of the seven basic WEAR-ARC hard facing electrodes does the best job . . . increases life as much as four times or more.

WEAR-ARC WH is ideal for build up on manganese steel; WEAR-ARC 12 for providing that hard wearing surface. Ask for bulletin No. 10550, illustrating and describing properties and welding procedures for the complete line of WEAR-ARC hard facing alloys.

"I Like the rod that comes in the RED can"

ARCALOY for stainless steel
NICKEL-ARC for cast iron
TOOL-ARC for tool steel
WEAR-ARC for hard facing
BRONZE-ARC for general use

SEE YOUR NEAREST ALLOY RODS DISTRIBUTOR

ALLOY RODS CO. York, Penna.

TELSMITH

NEW Tyrone Rock Products Co. plant PRODUCES 3000 TONS A DAY at low cost...with TELSMITH Conveying and Screening Equipment

TELSMITH

Equipment in this Plant

One (1) 5' x 12' Pulsator Single Deck Scalping Screen

One (1) 5' x 12' Pulsator Double Deck Scalping Screen

One (1) 4' x 10' Pulsator Double Deck Rinsing Screen

Eight (8) 5' x 12' Vibro-King Single Deck Finishing Screens

Two (2) 4' x 10' Vibro-King Single Deck Finishing Screens

Twelve (12) Telsmith-BG Conveyors 18" to 42" wide, 42' to 200' long

Fifteen (15) 16" x 18" Bin Gates Boquad Tunnel Type

• To serve the rapidly growing Atlanta market, this modern plant at Tyrone, Ga., is a remarkably efficient, low-cost operation. Designed and engineered by Telsmith, its average capacity is about 300 tons per hour with peaks of 450 tons. Highly efficient screening is supplied by 13 Telsmith vibrating screens making 8 sizes of crushed granite (−2" to −8 mesh) for railroad ballast, and concrete and asphalt construction.

Finished sizes are stockpiled over a reclaiming tunnel, then rinsed and delivered to bins for loading cars and trucks. Telsmith did all engineering, including detailed drawings, furnished all screens and conveyors and carefully co-ordinated all equipment for smooth, efficient operation. To relieve yourself of technical details and to be sure of satisfactory results, consult Telsmith without obligation. Send for Bulletin 266.

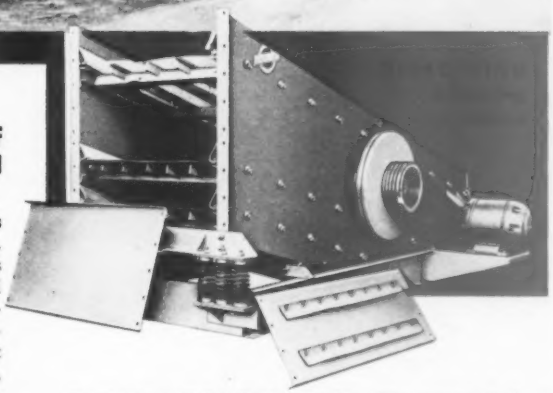
SMITH ENGINEERING WORKS
508 EAST CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

ENGINEERED

VIBRO-KING

For Finished Screening of Medium and Small Sized Aggregate

With its two bearings, the Vibro-King is simpler, more efficient, and upkeep is lower. Telsmith-patented automatic counter-weights assure smooth starting and stopping as well as exceptionally smooth operation. Its circular screening movement is uniform everywhere on the screen cloth, and is constant under any load. Entire vibrating mechanism, including vibrating unit and screen cloth, floats on nests of springs. Welded and reinforced main frame is *horizontal* for rigidity and easy installation. Cable suspension, if desired. Five sizes, 1, 2, or 3 decks.



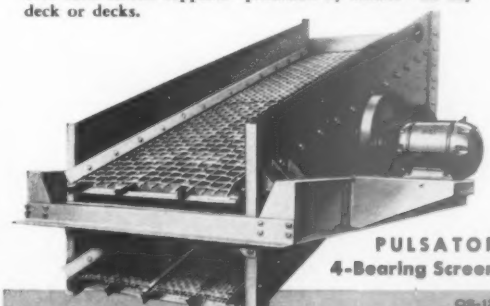
Changing Screen Cloth is Simple and Quick — The upper end of the Vibro-King is readily removable, making it a much easier job to change screen cloth and saving a great deal of time.

Screen Cloth Mounting—At customer's option — screen cloth may be mounted in rubber on steel screen trays; or stretched over steel screen supports—protected by rubber—on any deck or decks.

PULSATOR

For Heavy-Duty Scalping

A four-bearing, heavy-duty vibrator . . . for all kinds of screening, especially scalping, or large sized aggregate . . . Pulsator's circular movement gives uniform, efficient screening on all decks and under heaviest loads. The best alloy steels, the finest anti-friction bearings, protected by both labyrinth and piston ring seals, give longer life and lower upkeep. Eleven sizes, with 1, 2, or 3 decks.



PULSATOR
4-Bearing Screen

QS-12

Cable Address: Sewgworks, Milwaukee

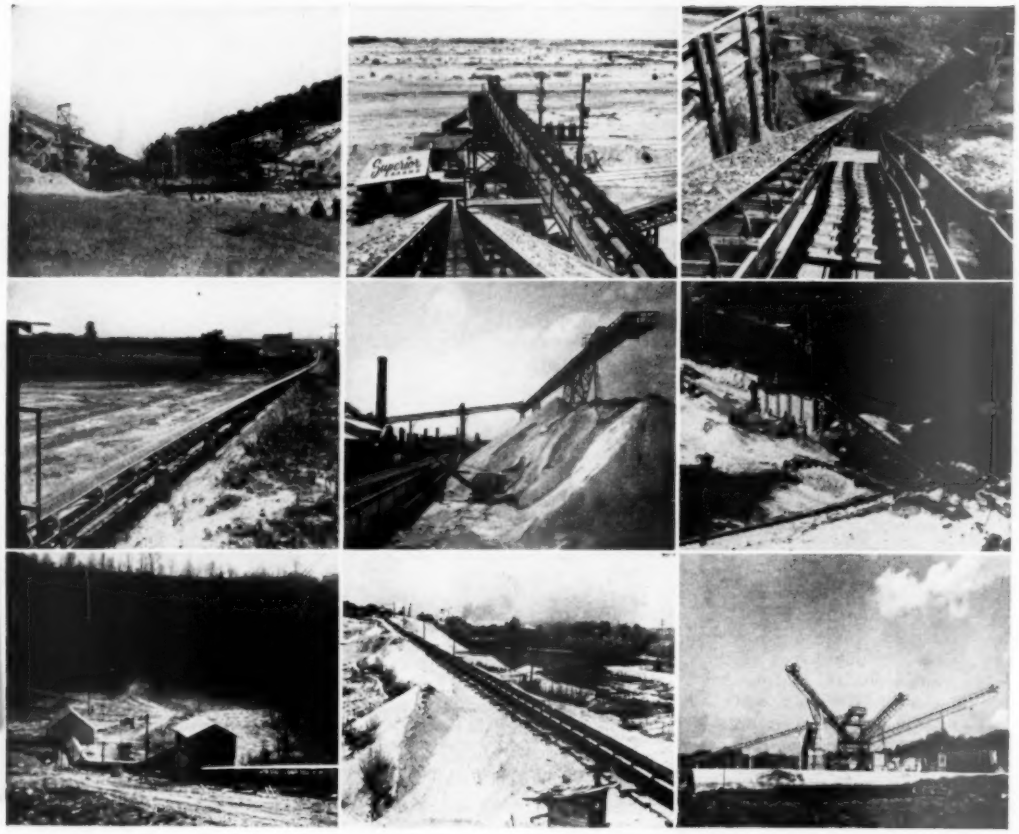
51 East 42nd St. New York 17, N.Y. · 211 W. Wacker Drive Chicago 6, Ill. · 713 Commercial Trust Bldg. Philadelphia 2, Pa. · 238 Main Street Cambridge 42, Mass. · Beebe Egpt. Co. Milwaukee 2, Wis. · A. N. Wigle, 382 S. Ashburton Rd. Columbus 13, Ohio

Clyde Equipment Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Egpt. Co., San Francisco 4, Calif. • Interstate Equipment Co., Statesville, N. C. • Bish Egpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Woomer-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

STONE HANDLING!

These are tough jobs—requiring sturdy equipment for long life and uninterrupted service.

That's why these operators specified *Continental*



HEAVY DUTY IDLER

STANDARD DUTY IDLER

SELF-ALIGNING TROUGHING IDLER

RUBBER DISC IMPACT IDLER

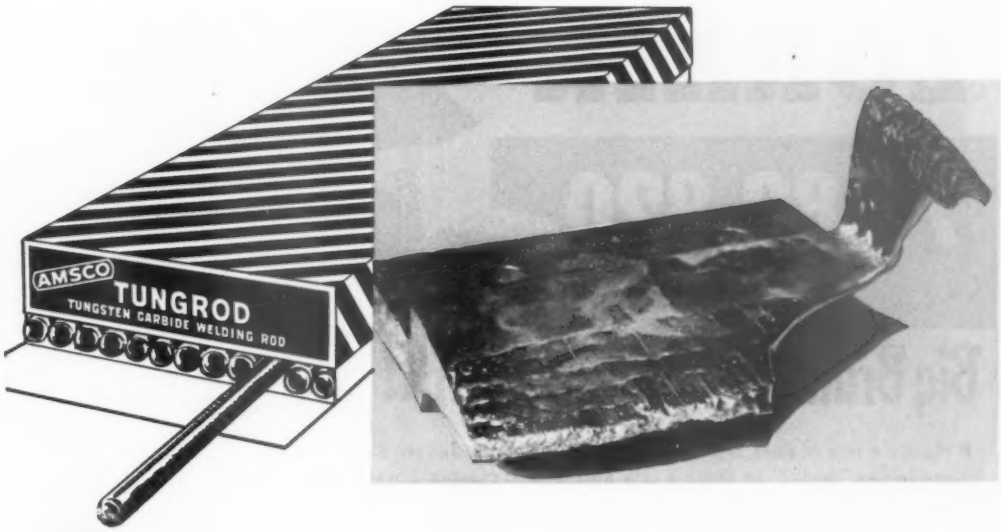
OTHER PRODUCTS: Elevators, Feeders, Screw Conveyors, Pulleys, Trippers, Buckets, Sprockets, Takeups and Bearings.

INDUSTRIAL DIVISION

CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS



Saved HUNDREDS OF DOLLARS PER MONTH IN PULVERIZING!

An example of how the AMSCO Hardfacing System can help you fight wear profitably

Here's why the AMSCO HARDFACING SYSTEM can save you money

Hardfacing recommendations are as sound as the manufacturer who makes them. For a half-century, Amsco has specialized in fighting the high cost of wear—first with manganese steel and later with another big weapon . . . AMSCO Hardfacing Rods and Electrodes.

The result is the AMSCO Hardfacing System . . . where a wide range of Amsco Rods are selected for use according to a systematic appraisal of the equipment part and wear factors involved.

Whether your particular problem is one of wear caused by impact, abrasion, heat, corrosion—alone or in combination . . .

Amsco has both the research facilities and the years of on-the-job experience necessary to help you make important reductions in your operating costs.

A large Pennsylvania brick company was faced with this problem: their pulverizer plows wore out every two weeks due to extreme abrasion of clay with a high silica content. An expensive period of down-time and replacement labor resulted.

In trying to stop this high replacement cost, a test was made. Each plow was hardfaced with AMSCO Tungrod—specially developed by Amsco research for high resistance to abrasive wear.

Result? The plows hardfaced with AMSCO Tungrod lasted 4 times as long . . . 3 out of every four replacement jobs were eliminated! The saving amounted to several hundred dollars *each month!*

AMSCO Tungrod permits big savings—through longer service and fewer replacements—on many other applications. If you have an equipment part used in cutting or pulverizing non-metallic materials, the possible savings—*to you*—are too big to be overlooked!

Write today for illustrated hardfacing catalog — and nearest distributor's name.

AMSCO®
WELDING PRODUCTS

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
377 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.

LORAIN

79-80-820 SERIES

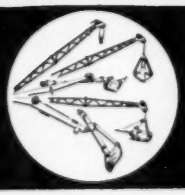
Big Bruisers for Busting Rock!

■ Here's a trio of rock busters at the top end of the Lorain line-up! They're the "big 3" in the 1½, 1¾ and 2-yard classes. Lorain 79s, 80s and 820s are designed for the rough, tough work in mines, pits and quarries... with stamina to slug it out with rock and stay on the job for a long time. There's tremendous power developed by the Center Drive Turntable, converted into "rock-busting" digging force through a positive independent chain crowd... and an all-welded shovel boom that meets any digging challenge. If it's rock you want to bust (not your shovel), be sure to check Lorain 79-80-820 performance!

Denver Crushed Stone Co., Inc. of Golden, Colorado, gets top tonnage from two Lorains, an "820" foreground and an "80" in background. For facts on all Lorains from ½-yard and up, get Lorain Condensed Catalog from your Thew-Lorain Distributor—or write to

THE THEW SHOVEL CO.
LORAIN, OHIO

THEW **LORAIN**® *on CRAWLER or RUBBER*

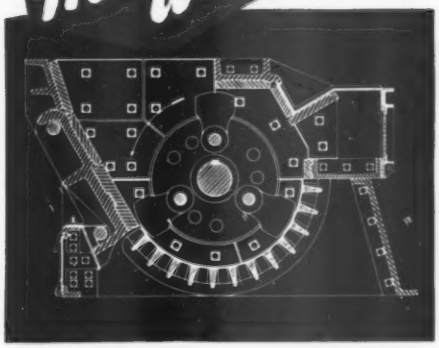


SHOVELS
CRANES
DRAGLINES
CLAMSHELLS
HOES

25% to 75% SMALLER INVESTMENT

with a Williams "Super-Slugger" Crusher

Here's why



Feed opening 41"x 30" to 51"x 81". Hammer blows 10,800 blows per minute in the smallest size, each blow 1,285,200 foot pounds to 17,280 blows per minute in the largest size, each blow 2,893,760 foot pounds. Size of product quickly changed by using grates with smaller openings.

because it reduces power shovel loaded rock to 1½ inch or ¾ inch in one operation

In one operation! That means not only a saving in machinery, less depreciation by wear and tear, but the additional savings of foundations, conveyors, drives and buildings. Because the Super-Slugger is a heavy duty hammermill that can crush power shovel loaded rock down to feed size for fine grinding or to commercial crushed stone. Built to do a giant sized job because it's heavily reinforced at all parts subject to shock and wear . . . with extra heavy manganese steel liners. Shafts of unusually large diameter. The Super-Slugger is a real payload and profit builder! For detailed information write for bulletin 634.

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
800 ST. LOUIS AVENUE ST. LOUIS 6, MISSOURI

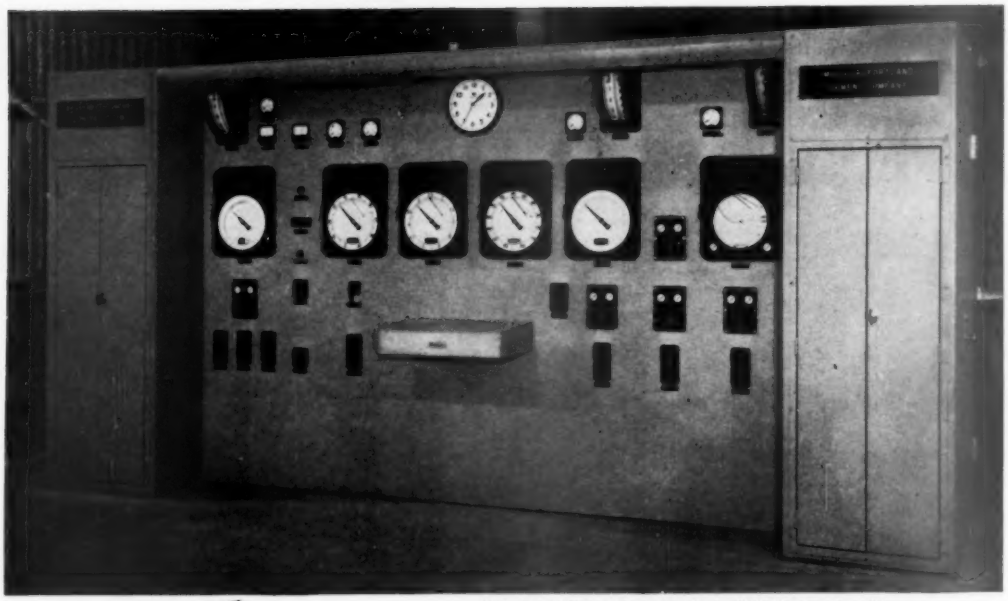
WC-48-4

WILLIAMS ALSO MAKES—

Heavy-duty hammermills in smaller sizes for all quarry operations; impact and roller mills for 200 to 325 mesh grinding; drier mills; air separators; vibrating screens; steel bins; complete "package" crushing and grinding plants.

WILLIAMS

CRUSHERS GRINDERS SHREDDERS



Main Panel Board for control of 3000 bbl per day Kiln at Missouri Portland Cement Company, St. Louis, Missouri.

3 Ways Better

...Bailey Control for Rotary Kilns

Bailey Control for Rotary Kilns gives you better performance three ways:

1. Economical Operation
2. Uniform Quality of Product
3. Reduced Maintenance

These are advantages which can be achieved when all phases of kiln operation are coordinated to work together as a team. Here's how Bailey Kiln Control can help you get all three.

ECONOMICAL OPERATION

With Bailey Combustion Control you can be certain that you are getting maximum product for every unit of fuel you burn. Bailey Control closely guards the Fuel-Air Ratio, Hood Draft, Fuel Feed, Clinker Cooling and the Temperature of Air for Combustion.

UNIFORM QUALITY OF PRODUCT

Bailey Instruments and Controls can help you achieve a uniform high grade product. Measurements of temperatures, kiln speed, combustibles content, and oxygen content can be transmitted to recorders on centrally located control boards like the one shown. There is no sacrifice of accuracy or speed of response. High temperature alarm contacts may also be provided with Bailey Pyrometers as a further aid in achieving optimum uniformity of product.

REDUCED MAINTENANCE

By maintaining uniform temperatures and excess air conditions in the kiln, Bailey Controls help to reduce to a minimum costly refractory repairs and wear and tear on auxiliary equipment.

Bailey Meter Company has a staff of engineers who are experts in the control of rotary kilns. Assure yourself of optimum kiln performance. Let one of these men help plan your Kiln Control System. P-22

BAILEY METER COMPANY

1039 IVANHOE ROAD • • • CLEVELAND 10, OHIO

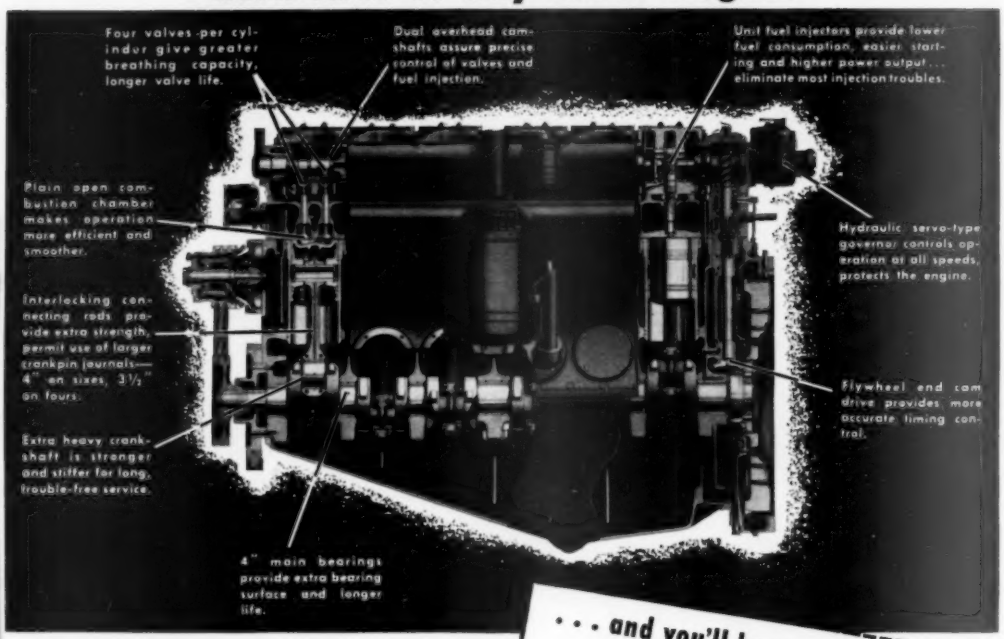
Controls for Processing

TEMPERATURE
PRESSURE
% OXYGEN
% COMBUSTION
FLOW
LEVEL
DENSITY
RATIO

50 LB. 1¼X8
HERCULES
GELAMITE
2
50 LB. 1¼X8
HERCULES
HERCOMITE
4
GET MORE EP* PER DOLLAR
*Explosive Power determines your dynamite dollar's true value. Get more for your money with Hercules Hercomites® and Gelamites®. They give better breakage than older-type explosives . . . are more economical than extra dynamites and gelatins. Among them there is one for practically every mining, quarrying, and construction need. Write for illustrated booklet, "Hercomites and Gelamites for Lower Blasting Costs."
HERCULES POWDER COMPANY 946 King Street, Wilmington, Delaware
EXPLOSIVES DEPARTMENT

Compa MURPHY DIESEL esign

with that of any other engine


Four valves per cylinder give greater breathing capacity, longer valve life.
Dual overhead camshafts assure precise control of valves and fuel injection.
Unit fuel injectors provide lower fuel consumption, easier starting and higher power output... eliminate most injection troubles.
Plain open combustion chamber makes operation more efficient and smoother.
Hydraulic servo-type governor controls operation at all speeds, protects the engine.
Interlocking connecting rods provide extra strength, permit use of larger crankpin journals—4" on sixes, 3½" on fours.
Flywheel end cam drive provides more accurate timing control.
Extra heavy crankshaft is stronger and stiffer for long, trouble-free service.
4" main bearings provide extra bearing surface and longer life.

. . . and you'll know why it gives you

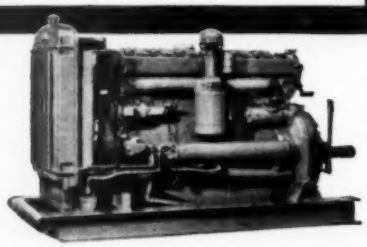
- **MORE POWER**
- **GREATER ECONOMY**
- **GREATER DEPENDABILITY**
- **LONGER LIFE**

MURPHY DIESEL

Heavy duty power

for rock crushing

Murphy Diesel Engines and Power Units for portable or stationary crushing plants, 90 to 226 H. P. 1200 and 1400 RPM. Generator Sets, 60 to 140 K.W.



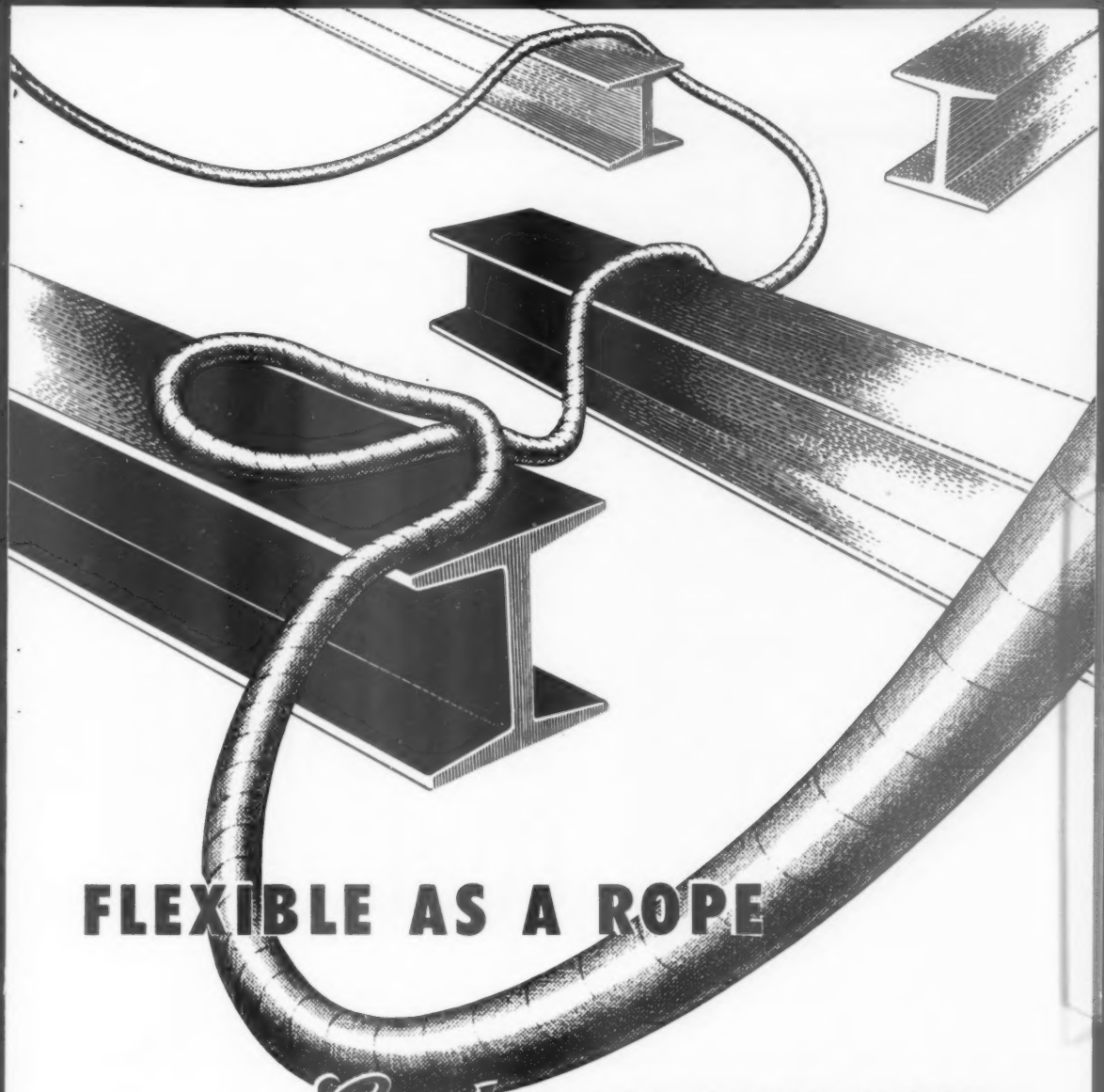
ONLY with Murphy Diesel do you get all the advanced design features described above . . . and only with Murphy Diesel do you get all extra power, economy, dependability and engine life that this design assures. Proved in thousands of hours of the toughest kind of service, this design has resulted from skilled engineering and long practical experience.

A more detailed discussion of these features and others is given in the booklet, *"10 Questions to Ask a Diesel Engine Salesman."* You can get a copy from your Murphy Diesel Dealer or we'll be happy to send you one.

MURPHY DIESEL COMPANY

5315 W. Burnham St. Milwaukee 14, Wis.

Sales, parts and service in principal centers



FLEXIBLE AS A ROPE

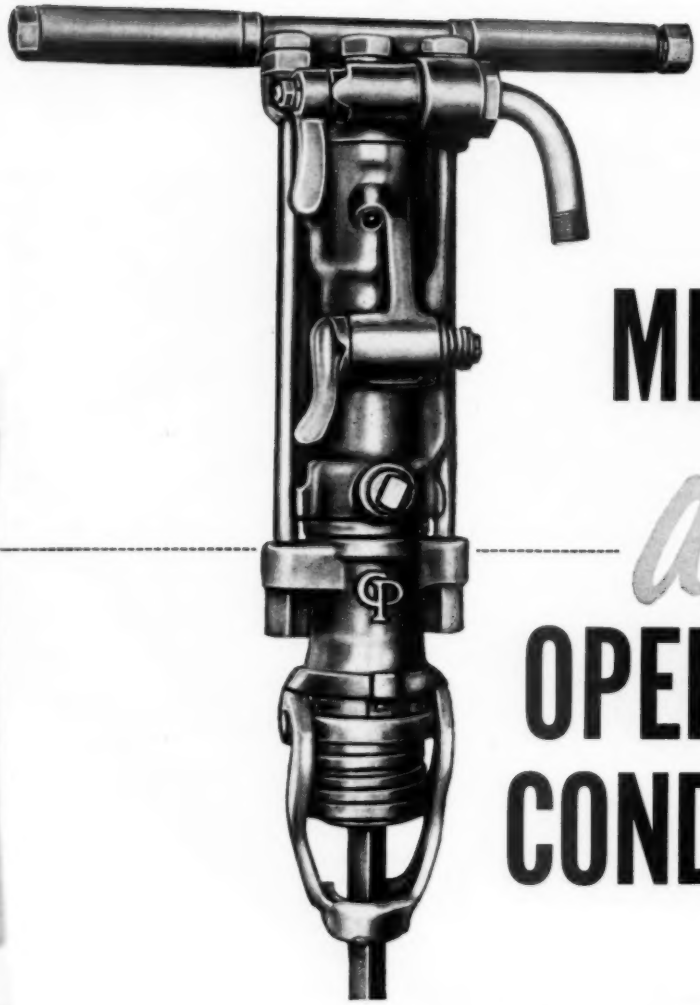
Condor HOMOFLEX HOSE

"Why, this hose is flexible as a rope!" say the men who work with it. • But it's no surprise to us—we engineered it that way. Homoflex has no pre-set twist, it coils and uncoils easily. It doesn't kink or collapse on sharp bends. It's light, but amply strong. It's easy to handle. It's sized uniformly. Workmen like it . . . It lasts longer. • How these advantages are built into Homoflex is in Bulletin 6879 D, mailed on request. • The same engineering goes into our V-belts, flat belting and conveyor belts. Just phone your R/M Distributor.

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive and Diamond Wheels • Bowling Balls



MEETS *all* OPERATING CONDITIONS

Not only does the CP-59 Sinker outperform any other drill in the 55-pound class, but it can be used for (1) plain dry, (2) blower dry, (3) plain wet, or (4) air-water operation.

This is made possible by its 4-in-1 backhead, which permits quick, inexpensive change-overs from one type of operation to another.

Its remarkably high drilling speed, exceptionally strong rotation, unsurpassed hole cleaning, excellent riding qualities—all make for fast, efficient, economical performance.

Maintenance is low because of such features as a replaceable bronze chuck rotation nut to protect piston splines from scoring, and a replaceable bronze bushing liner to make it easy to maintain piston alignment and full cushioning.

Get in touch with your nearest CP office for a demonstration of the CP-59, or write for a copy of SP-3009.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

What's U. S. Rubber doing with crushed rock, limestone and gravel?

THIS U. S. RUBBER BELT carries crushed limestone in a modern, highly efficient plant in the Midwest. The belt has 220-ft. centers and a 17-degree incline. The high output and high mechanization of this plant would be impossible without such specially designed products as this "U. S." Belt.

PRODUCTS OF U.S.RUBBER SERVING THROUGH SCIENCE

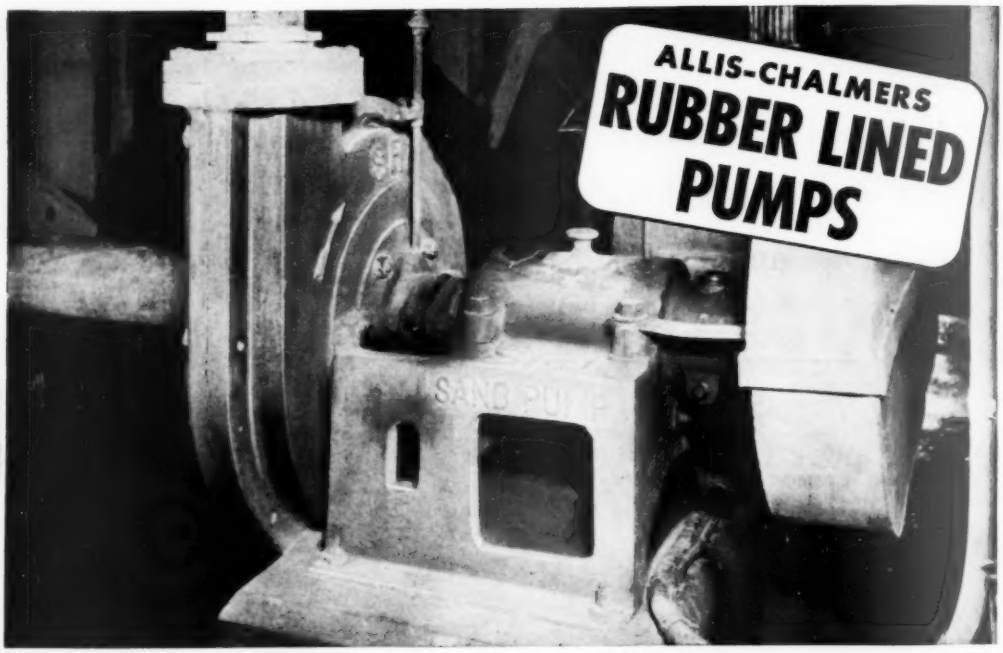
TODAY "U. S." belts perform an immense number of different tasks in different fields, making great savings in maintenance and in haulage time. "U. S." develops fabrics and compounds—to make belts that meet today's more rigorous demands on belting performance. "U. S." belts have a reputation for lasting years beyond expectations of operators.

GRAVEL PLANT that handles up to 150,000 tons of wet sand per year. The "U. S." belt on the outdoor installation above has been working steadily on this job for over 8 years and is still going strong.

HERE A "U. S." CONVEYOR BELT carries crushed rock from pit to surge pile. It has been in operation 8 to 10 hours a day for several years. Its present excellent condition indicates at least 10 years' service life.

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.



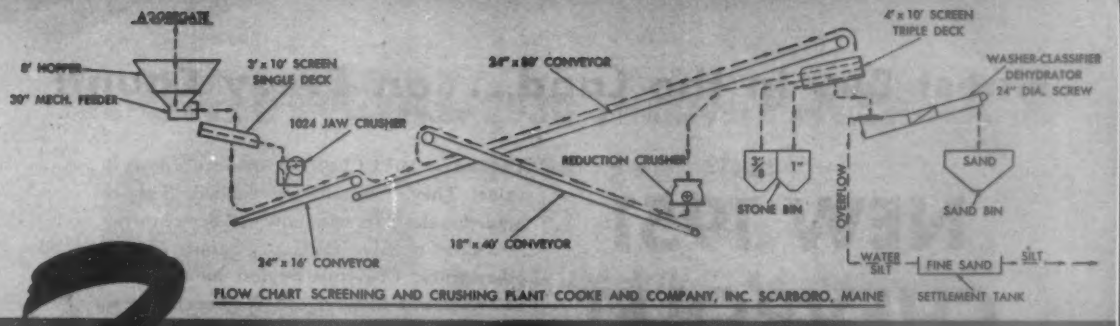
Gives You 4 Big Economies In Handling Fine Mesh Materials

1. **Long Life** — Rubber compounds especially made for each application provide from 10 to 50 times the wear resistance of the hardest metals on such jobs as pumping tailings, classifier overflow, grinding mill discharge and other operations involving hard, abrasive materials of ⅛" to 325 mesh size.
2. **Easy Servicing** — The rubber casing liner is completely separate from the casing. It may be removed and replaced without moving the pump itself. The impeller is screwed onto the shaft and also may be removed easily. Thus, a complete supply of spare parts may be kept on hand at moderate cost. Neither standby pumps nor long shutdowns for pump rehabilitation are required.
3. **Flexibility In Operation** — The Allis-Chalmers Rubber Lined Pump is usually driven by a *Texrope* V-belt drive. Its head and capacity may be varied considerably by simply changing the speed of the drive. Where changes are frequent, the *Vari-Pitch* Automatic sheave provides instant speed control at very moderate cost.
4. **Application Engineering** — Each job is individually engineered by a competent Allis-Chalmers application engineer who is familiar with solids pumping problems. You can be sure of exactly the right pump and exactly the right materials for lowest cost per ton pumped.

Get full details on what the Allis-Chalmers Rubber Lined Pump can do for you. Call your A-C District Office or write Allis-Chalmers, Milwaukee 1, Wisconsin, and ask for Bulletin 08B7311. A-3347

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS



FLOW CHART SCREENING AND CRUSHING PLANT COOKE AND COMPANY, INC. SCARBORO, MAINE

3 Times the Production

at less than HALF the cost

Over-all view of plant from discharge end. Truck in foreground is receiving load of washed sand from sand bin.

That's the experience of Cooke & Company with their new Austin-Western crushing and screening plant. Cooke & Company operate large gravel and sand pits in Scarboro, Maine; sell concrete mix, asphalt mix, washed gravel and washed sand. The separation of aggregate into stone of two sizes—"peastone" and "buckwheat"—and washed silt-free sand is the principal operation.

In the words of A. C. Stanley, president of the company—

"Compared with our previous operation, we save two trucks and four men — a total of $92.00 daily . . . are producing three times as much as before, at less than half the cost . . . quality of the gravel and sand produced has been very satisfactory . . . clean, carefully washed material is important when you want to obtain concrete that does not deteriorate."

Each Austin-Western plant is "tailor-made" for a particular production problem. Our engineering department will be glad to discuss yours.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

Close-ups of primary crusher, screen and feeder.

At the left, three-deck screen over two-compartment stone bin. At the right, sand-classifier-washer-dehydrator over sand bin.

Feeding and discharge ends of double-screw, 24" washer-classifier-dehydrator, which has a capacity of 120 tons per hour.

Austin-Western

Finest Buy in the Land . . . on *Every* Count!

NEW 1951 CHEVROLET

Advance-Design TRUCKS

These new 1951 Chevrolet trucks are tops in value. They're tough and rugged. They're loaded to the brim with power. They're thrifty . . . move massive loads . . . handle like no other truck. Chevrolet's latest haulers have 51's finest new features, too. Features like new, super-effective brakes that are extra-safe and easy to operate. Features like Chevrolet's Dual-Shoe parking brake, Chevrolet's new Ventipanes and new cab seats that bring you comfort with a capital "C." Visit your Chevrolet dealer and look over these great new trucks. You'll find the right truck for *your* job!

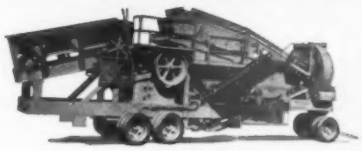
CHEVROLET MOTOR DIVISION, *General Motors Corporation*
DETROIT 2, MICHIGAN

CHEVROLET

ADVANCE-DESIGN TRUCK FEATURES

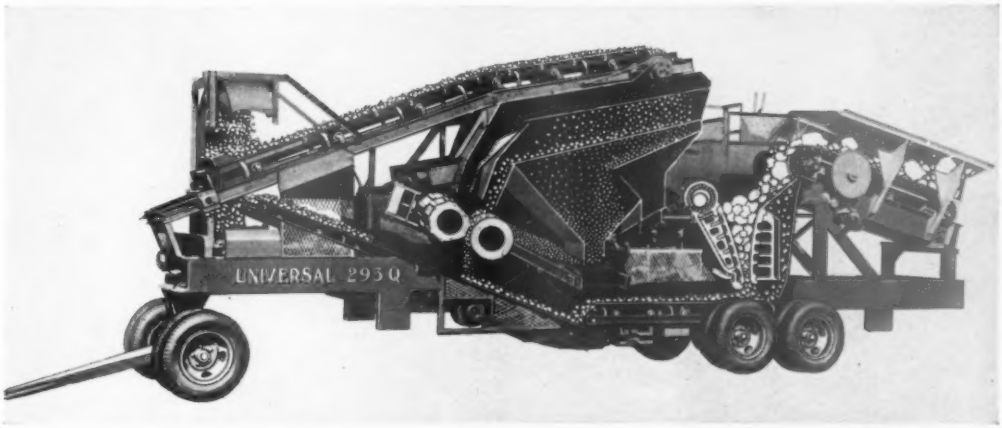
TWO GREAT VALVE-IN-HEAD ENGINES—the 105-h.p. Loadmaster or the 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • **POWER-JET CARBURETOR** — for smooth, quick acceleration response • **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement • **SYNCHRO-MESH TRANSMISSIONS**—for fast, smooth shifting • **HYPOID REAR AXLES**—for dependability and long life • **NEW TORQUE-ACTION BRAKES**—for light-duty models • **PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES**—for medium-duty models • **NEW TWIN-ACTION REAR BRAKES**—for heavy-duty models • **NEW DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models • **NEW CAB SEATS**—for complete riding comfort • **NEW VENTIPANES**—for improved cab ventilation • **WIDE-BASE WHEELS**—for increased tire mileage • **BALL-TYPE STEERING**—for easier handling • **UNIT-DESIGN BODIES**—for greater load protection • **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

The UNIVERSAL 293Q TwinDual PACEMAKER



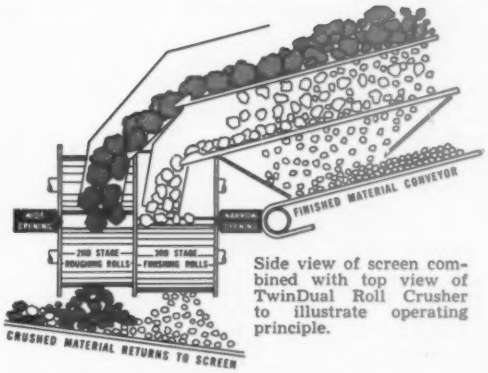
gives you these EXCLUSIVE Profit-Making Advantages

- ★ TwinDual Roll Crusher
- ★ Three separate crushing operations
- ★ Primary and Secondary on single truck
- ★ Only one plant to move instead of two
- ★ Only one power unit to service
- ★ Flexibility for rock or gravel
- ★ 20% greater screening efficiency
- ★ Better quality finished aggregate
- ★ Lower initial cost — lower maintenance cost
- ★ Top production



PIT OR QUARRY — rock or gravel. Name your operation. The TwinDual Pacemaker sets new standards for profitable hour after hour tonnage at low cost per ton. Three crushing operations with Universal's exclusive TwinDual Method provide top capacity, divide the load between three crushing stages. Permit a more favorable ratio of reduction resulting in longer crusher life, less maintenance and better quality finished product.

There is much more to the profitable TwinDual Story. Facts are yours for the asking. Bulletins U520 and U501 will give you detailed information.



Side view of screen combined with top view of TwinDual Roll Crusher to illustrate operating principle.

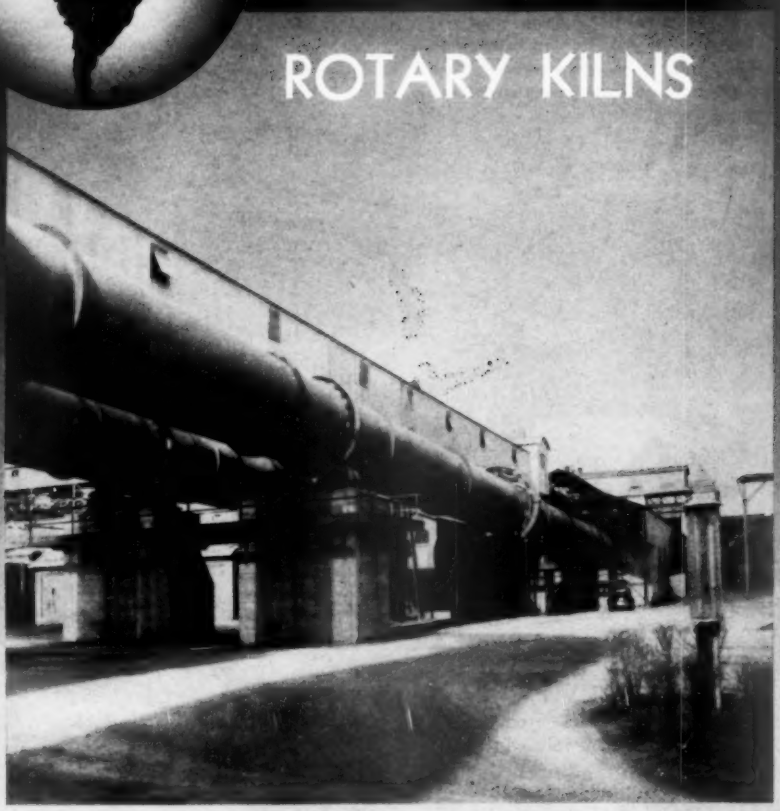
UNIVERSAL ENGINEERING CORPORATION division of PETTIBONE MULLIKEN CORP.

617 C Avenue N.W., Cedar Rapids, Iowa
Phone 7105

4700 W. Division St., Chicago 51, Illinois
Phone SPaulding 2-9300

SMIDTH

ROTARY KILNS



141 Smidth Rotary Kilns have been sold from January 1946 to December 1950.

For Smidth Machinery apply to:

F. L. Smidth & Co., A/S
Vestergade 33,
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"WE HEAR..."

April, 1951

Soil-cement is playing an important role in the battle for prevention of soil erosion at the Navy's Whiting Field, near Milton, Fla. Thousands of cubic yards of plastic soil-cement have been used in lining ditches, constructing ditch checks and building other conservation structures.

* * * * * * * * * *

Estimates of construction volume for 1951, as published by F. W. Dodge Corp. in November, 1950, have been revised slightly upward as a result of recent developments in the defense mobilization program. Viewpoints as to the nature of the predicted construction have also been revised. A total decline of 18 percent rather than the previously predicted 19 percent is now expected, as compared with the record-breaking construction volume of 1950. Recently ordered restrictions on commercial building are expected to be offset by increases in manufacturing plant, power plant, direct military building and civil defense construction. The November estimate of 1951 residential building was not changed, due to recent assurances by government authorities that they still plan to control non-farm housing units to a total of between 800,000 and 850,000 in 1951.

* * * * * * * * * *

A new rubber pinch valve for use in mining, paper, chemical and other industries has been developed recently by the mechanical goods division of U. S. Rubber Co. It is claimed that the valve will outwear metal when installed in pipe lines carrying abrasive or corrosive mixtures. It absorbs vibration, eliminates "water hammer," needs no packing or repacking, and affords a positive seal in the closed position.

* * * * * * * * * *

The Nevada State Legislature is seeking a "right-to-work" law which would ban making union membership a condition of employment.

* * * * * * * * * *

What may prove to be one of the nation's largest uranium deposits has been discovered in New Mexico by a Navajo Indian who "just decided to keep his eyes open." Initial surveys have shown a possible 10,000,000 tons of rock containing carnotite in a belt 6 to 12 miles wide extending for about 80 miles.

* * * * * * * * * *

A liquid chemical has been developed which, when poured on concrete flooring, penetrates and reacts on the lime and is said to cause a flintlike hardening of the surface. This is valuable in factories and warehouses where soft, dusty concrete floors may be considered harmful to health and equipment.

* * * * * * * * * *

The Interior Department reported that mineral production in 1950 rose to near-record levels, but still left shortages in some items, especially iron ore and copper. Output of all minerals rose 10 percent, 4 percent less than the record of 1948, and the overall value, due to increasing prices, rose 11 percent.

* * * * * * * * * *

First results of the 6-months road tests conducted by state and federal authorities at La Plata, Md., to check the mounting damage to public highways showed up as follows: The highway lane carrying single axle loads of 18,000 lb. had developed 75 ft. of cracks. The lane supporting single axle loads of 22,400 lb. had developed 360 ft. of cracks. The 32,000-lb. tandem lane had developed 140 ft. of cracks. The lane subjected to 44,800-lb. tandem loads had developed 2000 ft. of cracks. (This lane had to be repaired before the test period could be completed.)

WE HEAR

The National Production Authority is drafting an overall production-control measure, which will be a revision of the World War II controlled-materials plan. Under the plan, N.P.A. will find out how much steel, copper and aluminum would be needed to meet civilian and military requirements on a quarterly basis. If it finds one or more of these metals in short supply, it will order cuts in the production of some civilian goods. The plan is expected to be in operation by July 1.

* * * * * * * * * *

Engineering construction for the first six weeks of 1951 totaled $2,057,715,000, a gain of 69 percent over the same period in 1950, as reported by Engineering News-Record. Private construction was up 123 percent, and public works, 18 percent.

* * * * * * * * * *

Manufacturer's sales in 1950 totaled $235 billion, an increase of 18 percent over the 1949 figure. The gain reflected both higher prices and greater volume. Sales of durable goods climbed 25 percent, compared with a 12 percent increase in soft goods volume.

* * * * * * * * * *

Some U. S. truck drivers, appalled by the death in 1950 on the nation's highways of six times as many Americans as lost their lives in five months of fighting in Korea, have come up with a set of "rules drivers live by, violators die by." The rules were drawn up in a highway safety essay contest sponsored by Fruehauf Trailer Co. The drivers offer the rules in the hope they will enable some of their fellow highway users to "live to see the end of 1951."

* * * * * * * * * *

Cold weather eased the cement shortage in the late winter. It has been reported that several cement plants, scattered in different parts of the United States, recently had closed down because their finished storage silos are full.

* * * * * * * * * *

Construction contract awards in the 37 states east of the Rockies in January, 1951, totaled $1,043,248,000, which was an 11 percent decrease from the previous month, but still 43 percent above the January, 1950, total, according to a F. W. Dodge Corp. report.

* * * * * * * * * *

Damages totaling $10,000 occurred when wind-driven logs smashed the pier of a gravel and supply company near Seattle, Wash. The logs took out one section of the pier, sunk the company's 26-ft. work boat and damaged or knocked out scores of piles. Several thousand feet of lumber on the broken section of the dock went into the harbor.

* * * * * * * * * *

The Subcommittee on Roads of the Senate Committee on Public Works recommended federal highway aid of $773,500,000 annually for the next two fiscal years. The bill included an increase in the federal aid secondary authorization from the $150,000,000 voted earlier by the House to $200,000,000. In addition, the subcommittee wrote into the bill language which expressed the intent of Congress that F.A.S. funds be used primarily for local rural roads.

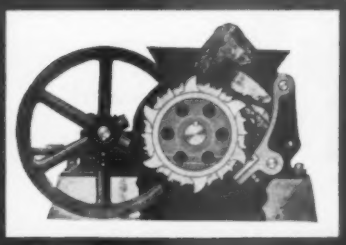
* * * * * * * * * *

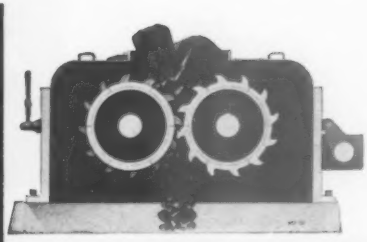
Large deposits of strategic minerals have been discovered in southern California by Geological Survey scientists. Among the minerals found were cerium, lanthanum, neodymium and praseodymium. These minerals, commonly known as "flints," are used in lamps and lighters, but also have considerable defense importance in such items as arc lamps, tracer bullets and star shells, and some of them may play an important role in atomic research. In addition to the flints, deposits of barite and thorium have also been found.

* * * * * * * * * *

There has been increased activity in asbestos mining in British Columbia. It is reported that exploration has revealed both slip and cross fiber types of asbestos in surface deposits at Sproat Mountain. Approximately $600,000 is being spent to get the mine into production by September, 1951. Another potential mine has also been discovered in northern British Columbia near the Yukon border. Transportation difficulties will have to be overcome before development of this mine can be started.

THE EDITORS





CRUSHERS
PULVERIZERS
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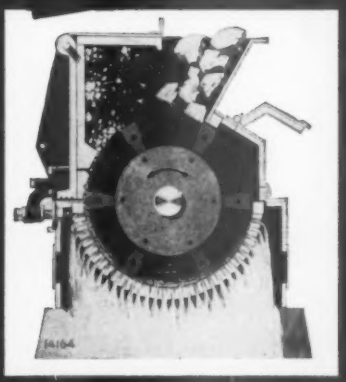

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PORTABLE CONVEYOR

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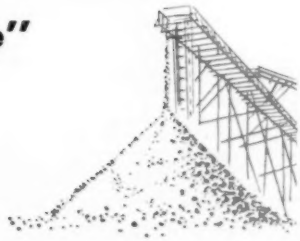

Gardner-Denver equipment helps you eliminate lost minutes — gives you a good chance to speed up quarry production — at a lower cost per ton.

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★ ★ ★ Editor's Page

Permanent Ill Effects Can Come From Temporary Regulations

IT IS EXPECTED, maybe too optimistically, by industry and the public that the wave of restrictions and regulations coming out of Washington will necessitate a tightening of belts in order to serve just a temporary period while the nation gets fully prepared for any war emergency. That is probably correct and it is also likely that the intent is to permit relaxation of controls later.

Predictions that a return to near normalcy may come late in 1952, barring all-out war, give a note of optimism but the question is whether or not lasting effects that will prove unpalatable might result out of all this emergency thinking. It seems to us that the greatest danger is in actions that affect labor relations and wages because, war or not, the trend apparently is to yield to labor wherever there is conflict with management.

Theoretically, we now have wage ceilings and we do have price ceilings. The latter evidently will be enforced rigidly while wage controls apparently will continue to be flexible. Employers, while they may be permitted to use discretion to make wage adjustments upward under specific circumstances, are not to seek compensating price increases.

Labor Trends

With availability of manpower likely to be the determining factor in whether or not certain industries and businesses can survive, it becomes obvious that industries operating on narrow profit margins have either of two bad choices to make. One course is to lose workers to pirating industries which are constantly dangling offers of higher wages under the noses of workers; the other is to adjust wage scales as a matter of defense but at the expense of reasonable profit.

Another disturbing factor is that labor continues to get away with a disproportionate share of the influence in Washington. No one can blame labor for seeking high wages for its services but events are building that threaten to break down all the progress that had been made since the past war in the development of honest-to-goodness collective bargaining at the plant level.

Since labor representatives saw fit to walk out on the ten percent formula, the Wage Stabilization board has started to make concessions. First, there was approval of living-cost escalators and now we have a desire to allow the wage control board to get in on settling disputes.

That would be an unfortunate development. It would be inflationary and it would add up to compulsory arbitration hitting only at management. Should bargaining fail and strikes threaten, wage settlements would fall in the hands of Washington where there is no lack of appreciation of labor's political power.

Then, labor would conveniently find it difficult to work out satisfactory wage scales with management, as was done under the recent War Labor Board, and would threaten to strike with the objective of having the dispute handled in Washington. Then, as before, would follow wage increases and then the pressures to increase prices would mount.

Labor-Saving

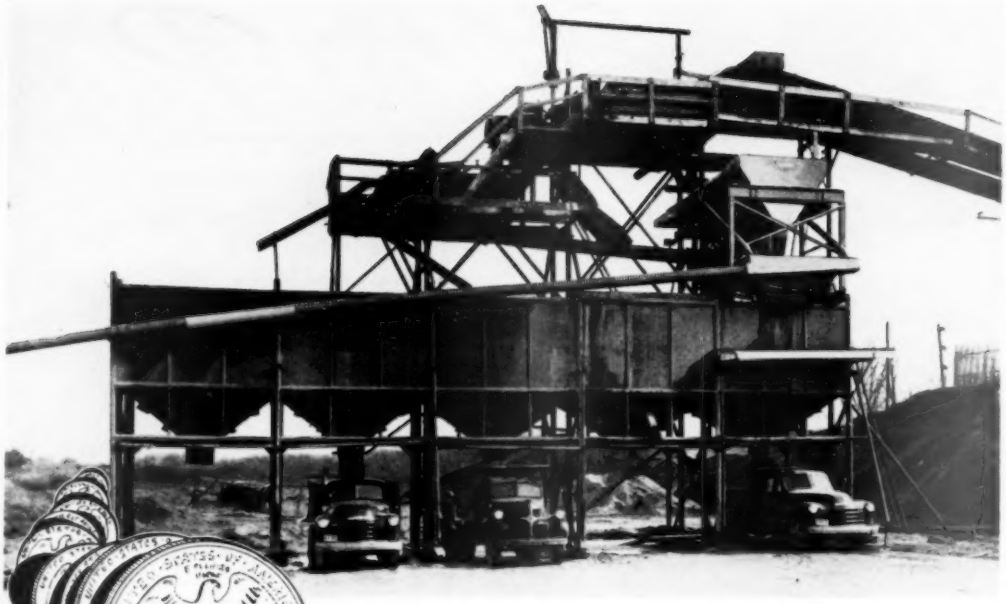
High wages are inevitable and constitute a challenge to management particularly in times when there are so many other obstacles to profit-making. High wages, however, do have the advantage of stimulating new labor-saving devices even in industries like the rock products industries which have operations that have always been considered difficult to mechanize.

Presently, much emphasis is on the exercise of ingenuity in keeping existing equipment in operating condition and in improving plant efficiency through reappraisal of operating details but, with wage levels continuing at record highs over a prolonged period, it isn't unlikely that entirely new and radical departures in production methods will follow. It would be timely now for those in the industry who have new concepts of plant operations to start some action.

The mining of coal has always been thought to be most difficult to mechanize, and as recently as three years ago the continuous mining machines now being widely adopted were only a dream in someone's imagination. Today, productivity is being tripled in coal mines as a result of using faster, lower-cost and simplified mining methods attainable in a single machine. Labor costs, at the face, have been reduced up to fifty percent.

Incidentally, John L. Lewis has not opposed mechanization but he does foresee times when there will be fewer miners. He wants to make certain that those who remain are well-paid which, it seems, is a legitimate goal. There would be little argument against that in a highly-mechanized rock products industry.

Bror Nordberg



Ever hear Eagles Sing?

IT SOUNDS like a cash register symphony. A couple of Eagles are singing at the plant of Quillin Bros., Lodi, Ohio, shown here. Material from the bottom deck of screen is chuted to an Eagle Water Scalping Tank which concentrates solids and scalps off excess water. The concentrated material is bled to an Eagle Washer - Classifier - Dehydrator, directly below. Adjustable U-shaped weirs enables Quillin Bros. to retain the mesh they want when they want it. Any contamination in sand is washed away. Material goes to bins with excess moisture removed. Cost per yard for processing this premium material is figured in cents. If your profit picture isn't what it should be let Eagles sing for you! Ask for Catalog 47—Washers, and Bulletin 150—Water Scalping Tanks.

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Rocky's NOTES

Nathan C. Rockwood

Technical Details of Agricultural Chemistry

THERE ARE PROBABLY some producers and salesmen of agricultural lime, limestone, gypsum and phosphate rock interested in agricultural chemistry, at least as it relates to soil chemistry. It appears, however, the growth and fruition of plants being such a complicated process, as at present understood, that some acquaintance with the chemistry of vegetable structure and its composition is also necessary. For students of these processes of living things, plants and animals which live from eating plants, directly or indirectly, we have before us a recent and very complete textbook: "Agricultural Chemistry—A Reference Text,"* of which Dr. D. E. H. Frear, of Pennsylvania State College, is editor.

The book is a collection of papers, or chapters, on various phases of agricultural chemistry by foremost authorities, divided into five parts, with from three to eight chapters in each part. Part I deals with "some fundamental materials and processes common to plants and animals"; Part II with "chemical processes of fundamental importance in agriculture"; Part III with "plant chemistry"; Part IV with "animal chemistry"; Part V with "soil chemistry."

Complicated Life Processes

A great deal of attention has been given in recent years to the possible roles of trace elements in plant and animal life. It is a subject that all fertilizer manufacturers are or should be interested in, and we include lime, limestone and gypsum producers as fertilizer manufacturers. Chapter VIII (Part III) is therefore of particular interest as it describes the absorption and utilization of inorganic substances by plants. While it is known that various other elements have some effect on plant growth and nutrition, the only ones thus far proved absolutely essential to plant life are: nitrogen, phosphorus, potassium, sulfur, calcium, magnesium, iron, boron, manganese, copper, zinc, and probably molybdenum. This is the conclusion drawn from water culture experiments with dissolved salts.

The experiments, even under the best laboratory controls, are very difficult because it is almost impossible to obtain chemically pure ingredients. Thus the iron or copper salt used may contain traces of cobalt and other metals, and whether or not these are essential to plant life is not definitely known. The study is very complicated because the presence of one of these metallic elements may have an important effect on the absorption of another. They sometimes substitute for one another, or the presence of trace amounts of one or more may actually control the absorption of really essential elements. It is a fascinating subject and one which obviously is vital to the maintenance of healthful life, not only of plants but of animals, including mankind.

A statement of general interest is that the reproductive parts of a plant are far more affected by nutrient deficiencies than the vegetative parts. The seed or the fruit of plants, which mankind is most interested in as a food supply, tend to retain a constant inorganic (mineral) composition; where the soil is deficient in some of these elements, the plant simply bears less seed or fruit. Therefore, it follows of course, that a luxurious vegetation is not necessarily an indication of a healthful plant, so far as its food value is concerned.

Trace Minerals in Animals

The list of elements essential to animal life is somewhat longer than that for vegetation; in addition to those previously mentioned are sodium, chlorine, iodine and cobalt. Other elements whose functions are not definitely known, but present, are silicon, boron, aluminum, arsenic, bromine and others. Deficiencies in some of the essential minerals in farm animals have been classified by observable symptoms and measures can be taken to correct them. Unfortunately, it does not appear that the medical profession has made a similar study of mineral deficiencies in humans and is thus able to identify symptoms except in some specific cases. Eventually it is quite possible that many of our modern diseases can be traced to exhaustion of certain mineral elements in the soil from which our food comes, directly or indirectly through farm animals.

Chemistry of the Soil

The chapter on the "Colloid Chemistry of Soils" should interest students of cement and concrete as well as those in agriculture. The colloidal clay minerals have their counterparts in cement, mortar and concrete. The author, Ernest A. Hauser, Massachusetts Institute of Technology, states: "This concept of the colloidal micelle and of the electric forces connected with it has finally enabled us to offer a simple explanation for many of the properties which are so characteristic of clays, and which up to not so long ago, baffled the chemist who could only rely on the results of chemical analysis of a substance."

The concept described concerns the colloidal sol (of micelles of clay particles each surrounded by clouds or shells of free ions, both positively and negatively charged), the formation of a gel by the approach of these micelles to each other due to partial neutralization or equalization of these electrical charges, with eventual coagulation when the particles are neutralized and join more or less closely. This is the same idea we expressed in the review of the recent textbook on geochemistry in our February Notes.

The author gives us this belief in the following quotation: "The development of the concept which considers the individual clay particle as a colloidal micelle has given the real basis for the understanding of the reactions which control flocculation, deflocculation, and dispersion of clay suspensions. From the foregoing discussions it is evident that these phenomena depend on the ion distribution in the diffuse double layer surrounding every particle. Thus an ion which will cause a reduction in the electrokinetic potential will tend to decrease the stability of the suspension, whereas ions which will aid in building up the diffuse ion double layer will act as stabilizing or dispersing agents." That is, stabilize the sol.

Obviously, in portland cement pastes we have negatively charged micelles of silica, alumina, iron oxide, and we have wandering positively charged ions of calcium (or calcium oxide or hydroxide micelles), sodium, and potassium. We have water molecules and ionized water, which is negative OH ions and positive H ions. Eventually we will be able to understand that if we have a surplus of calcium, sodium and potassium cations, or calcium hydroxide micelles, we must introduce more negatively charged micelles of silica, alumina or iron oxide, or some other iron bearing material. Otherwise we will have an unstable cement matrix in our concrete. Chemistry alone will never enlighten us on what is actually taking place.

*D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N. Y. Price, $9.50.

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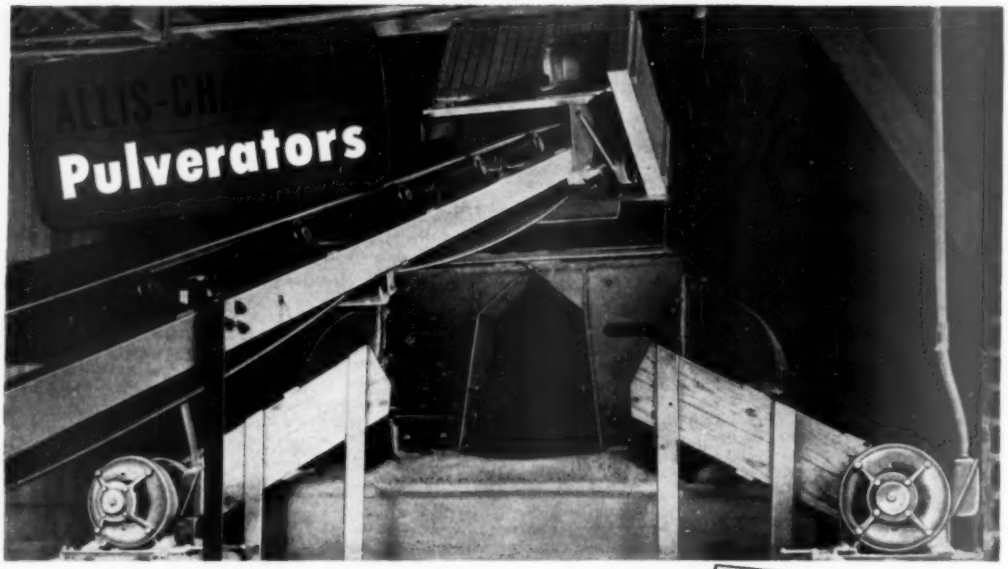

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LABOR RELATIONS TRENDS

Wage and Price Freezes and Thaws

By NATHAN C. ROCKWOOD

WE ARE ABOUT TO WITNESS one of the gravest, most interesting and probably futile experiments in "planned economy." It is nothing more or less than an attempt to stop inflation by again treating its symptoms and largely ignoring the primary causes. We are to "stabilize" prices and wages but continue to issue new federal credit and currency regardless. Private credit controls accomplish little if the government's own credit is practically unlimited, since the federal government is by far the nation's biggest spender and debtor.

Executive Order 10161, issued January 26, 1951, establishing the Economic Stabilization Agency, reads as if the Administration were fully aware of the dangers of the rapidly growing inflation. For example, it is stated in the preamble that "every 2 percent increase in the price level means that the cost of the present security program goes up one billion dollars per annum. Every 1 percent rise in the cost of living means that consumers are called upon to spend an additional two billion dollars annually for the same goods and services." The cost of carrying the federal national debt at the present time is around five billion dollars per annum. Thus, the government could afford to increase the cost of carrying the national debt by 20 percent, with no greater out-of-pocket cost than in allowing a 2 percent increase in the price of the things it buys for security and defense alone. In other words it could afford to raise the interest rate on all outstanding bonds and securities to 3 percent without losing as much as it is in maintaining its present interest rates at 2½ percent, and less on short-time securities.

The difference between 2½ and 3 percent on federal government securities would make them attractive for permanent investment; would reduce the amount forced on the Federal Reserve System; would help stop constant cashing in of bonds held by investors; would raise commercial interest rates and therefore restrict credit, and limit the present unlimited issue of Federal Reserve Bank credit and currency, in line with the original intention in establishing the Federal Reserve System. The real cause of inflation, as most sound reasoning economists realize, is the issue of too much money and credit for current production of tangible wealth. Under the present scheme, production of consumer goods is to remain constant at best while the volume of money it represents goes on increasing without rhyme or reason.

Price Stabilization?

The Executive Order first attempts to place a price ceiling in these phrases:

"Sec. 2. (c) *Prohibitions.* After the date of this order, regardless of any contract or other obligation, you shall not sell, and you shall not buy in the regular course of business or trade, any commodity or service at a price exceeding the ceiling price established by this regulation.

"Sec. 3. *Ceiling prices for all sellers for commodities or services sold in base period* [Base period is December 16, 1950 to January 25, 1951]. Your ceiling price for sale of a commodity or service is the highest price at which you delivered it during the base period to a purchaser of the same class. If you did not deliver the commodity or service during the base period, your ceiling price is the highest price at which you offered it for base period delivery to a purchaser of the same class. The offer must have been made in writing, but in the case of a retailer may have been made by display.

"Sec. 4. *Manufacturers' ceiling prices for new commodities falling within categories dealt in during the base period.* (a) If you are a manufacturer of a commodity which you did not deliver or offer for delivery during the base period but which falls within a category in which you dealt during the base period, determine your ceiling price by applying to your current unit direct cost the percentage markup you are currently receiving on a comparison commodity.

"Your current unit direct cost for the commodity being priced and for the comparison commodity shall consist of the total unit direct labor and direct material cost for each. The comparison commodity must be in the same category as the commodity being priced; must be a commodity for which your ceiling price was determined under Section 3; and must be of the commodities in that category with lower current unit direct costs, the one most nearly like the commodity being priced. If there is no commodity in the category having a lower current unit direct cost, your comparison commodity is the one with the same or higher current unit direct cost which is most nearly like the commodity being priced."

There is a lot more to the regulations, but the quotation will suffice to show that the method adopted is to attack the tail of the economic system first and most vigorously. To begin with there is a long list of commodities exemnt at the very start. These do not include any that our readers are directly interested in, but they all enter into the cost of living and the cost of doing business, so that they must all eventually be reflected in the cost of labor and materials in these rock products industries.

Wage Stabilization?

The first General Wage Stabilization Regulation No. 1 was issued January 26, 1951. Herein it was stated:

"Section 1. *General stabilization of wages, salaries and other compensation.* No employer shall pay any employe and no employe shall receive wages, salaries and other compensation at a rate in excess of the rate at which such employe was compensated on January 25, 1951, without the prior approval or authorization of the Wage Stabilization Board. New employes shall not be compensated at rates higher than those in effect on January 25, 1951, for the jobs for which they are hired.

"Sec. 2. *Other existing regulations and orders superseded.* The provisions of this regulation shall supersede the provisions of existing wage regulations and orders of the Economic Stabilization Agency. Wage Procedural Regulation No. 1 is herby revoked.

"Sec. 3. *No rates below May 24-June 24, 1950, period.* Nothing in this regulation shall be construed to require the stabilization of wages, salaries and other compensation for any job at a rate less than that paid during the period from May 24, 1950, to June 24, 1950, inclusive.

"Sec. 4. *Definitions.* The term wages, salaries and other compensation shall have the meaning defined in Section 702 (e) of the Defense Production Act of 1950.

"Sec. 5. *Petitions for approval of increases.* Petitions for the approval of any increase in wages, salaries and other compensation affected by this regulation shall be filed with the Wage Stabilization Board.

"Sec. 6. *Modifications and amendments.* This regulation may be modified, amended or superseded by orders or regulations hereafter issued by the Wage Stabilization Board."

Apparently the only "freeze" in this regulation is the "floor" set by the rates in effect during the base period May 24 to June 24, 1950.

Exceptions began to be promulgated almost immediately. General Regulation No. 2 was issued January 31. This "authorized payment of increased wages and salaries and other compensation provided for by written agreement executed on or before January 25, 1951, or formally determined and communicated to the employes on or before said date, which increases by the terms of said agreement or communications, are to take effect and to be applicable to work performed after January 25, 1951, but not later than 15 calendar days after said date." This is supposed to have been issued to take care of the contract made by John L. Lewis and the coal

(Continued on page 156)

KRAFT BAG

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the *Personal Side* of the news

Distinguished Service Award

A. T. GOLDBECK, engineering director of the National Crushed Stone Association, Inc., Washington, D. C., has been presented the Distinguished Service Award by the Highway Research Board of the National Research Council in recognition of his outstanding achievement in the field of highway research. He was present when the Highway Research Board was organized, attended the first annual meeting, and was the first chairman of one of the first committees of the Board.

A. T. Goldbeck

Born in Philadelphia, Penn., Mr. Goldbeck graduated from the University of Pennsylvania with a B.S. degree in civil engineering in 1906 and a degree of C. E. in 1923. He was an instructor at the university for two years and at Lafayette College for two years before starting his career in research. He joined the staff of the Office of Public Roads in 1910, became assistant engineer in charge of the Philadelphia Municipal Laboratory in 1913, rejoined the reorganized laboratory of the Bureau of Public Roads and Rural Engineering in 1915, and served the Bureau first as engineer of tests and then chief of the division of tests. In these capacities he directed researches in concrete pavement design including the studies of stress distribution under static and moving loads, subgrade pressure measurements, studies of subgrade friction, the flow of concrete, measurements of expansion and contraction, and other studies pertaining to pavement design.

Mr. Goldbeck is an active member of the American Society for Testing Materials; American Concrete Institute, of which he is now vice-president; American Institute of Mining and Metallurgical Engineers; The Association of Asphalt Paving Technologists; American Road Builders Association; American Association of State Highway Officials; American Railway Engineering Association; The Highway Research Board, and others. He served for 14 years as chairman of the Committee on the Structural Design of Highways of the Highway Research Board, was a member of the executive committee from 1931 to 1939, and was chairman of the board from 1934 to 1935.

Benson Succeeds Graves

OTHO M. GRAVES has been elected chairman of the board of the General Crushed Stone Co., Easton, Penn. He succeeds John Rice, Sr., who has been named honorary chairman. Oscar E. Benson, vice-president, has been elected to succeed Mr. Graves as president. Mr. Graves has been associated with the company since 1918, when he resigned as professor of graphics at Lafayette College. He served as assistant to the president and in 1927 was named vice-president and general manager. He became president in 1931 when Mr. Rice was elected chairman of the board. Mr. Graves is an authority on seismographic testing in quarry blasting. He served for four years as president of the National Crushed Stone Association, and has been a director of the National Association of Manufacturers. He is a member of the National Safety Council and the executive committee of the cement and quarry section of the Council. He is also a consultant to the United States Bureau of Mines.

Otho M. Graves

Mr. Benson joined the company as assistant to the president in June, 1947, and in September of that year he was elected vice-president. Before his association with General Crushed Stone Co. he was manager of the Easton division of the Metropolitan Edison Co. from 1942 to 1946, when he was named vice-president and placed in charge of the York division.

Oscar E. Benson

Mr. Rice's election as honorary chairman climaxes an association which began in 1899, when with the late Harry H. Mitchell and the late Prof. James Madison Porter he founded the General Crushed Stone Co. He was the company's first vice-president, and in 1904 succeeded to the presidency. He has been chairman of the board since 1931. Mr. Rice's son, John Rice, Jr., is vice-president of the company. Redington Moore is secretary-treasurer.

Officers Re-Elected

RUSSELL RAREY has been re-elected president of The Marble Cliff Quarries Co., Columbus, Ohio. H. J. Kaufman has been re-elected chairman of the board of directors; E. J. Kaufman, vice-president; Robert H. Pausch, secretary-treasurer, and U. C. Kaufman, assistant treasurer and credit manager. Stephen Stepanian, vice-president of the Arrow Sand and Gravel Co., a division of the company, and R. C. Ninde of The Marble Cliff Quarries Co. have been elected to the board of directors. Mr. Ninde replaces the late W. H. Hoagland, who formerly served as president and later as chairman of the board.

Mine Foreman

RAYMOND E. PETTY has been appointed foreman of the limestone mine operated at Zanesville, Ohio, by the Columbia Cement Division of the Pittsburgh Plate Glass Co., Pitts-

Raymond E. Petty

burgh, Penn. A native of Amherst, Ohio, and a graduate of Ohio State University with a B.E. degree in mining, Mr. Petty has been associated since 1943 with the company's deep limestone mining operation at Barberton, Ohio.

A.C.I. President

HARRY F. THOMSON, manager, Redi-Mix Concrete Division, Material Service Corp., Chicago, Ill., was elected president of the American Concrete Institute at the 47th annual convention held recently in San Francisco, Calif. He succeeds Frank H. Jackson, principal engineer of tests, Bureau of Public Roads, Washington, D. C. Henry L. Kennedy, manager of the cement division, Dewey and Almy Chemical Co., Cambridge, Mass., was elected vice-president for a two-year term, and A. T. Goldbeck, engineer director, National Crushed Stone Association, Washington, D. C., who was elected for a two-year term as vice-president in 1950, continues in that office. Elected to three-year terms as directors on the board of direction were Frank Kerekes, assistant dean of engineering, Iowa State College, Ames, Iowa; G. L. Lindsay, director of tests and research, Universal Atlas Cement Co., New York; I. E. Morris, consulting engineer, Atlanta, Ga.; and Walter H. Price, head of the materials laboratory for the Bureau of Reclamation, Denver, Colo.

Mr. Thomson has been associated with the ready-mixed concrete industry for many years, and has been active in ACI affairs since 1928. He was elected vice-president in 1949 and has served on the board of direction and various administrative committees. After graduating from Washington University, St. Louis, in 1910, he did graduate work and served as instructor and research worker at the Massachusetts Institute of Technology for four years. He returned to St. Louis in 1914 to become associated with the Provident Chemical Works as assistant superintendent. Subsequently he became Eastern manager in New York City and then sales manager. He was appointed vice-president in 1920. Four years later, Mr. Thomson moved to Birmingham, Ala., as executive assistant of the Federal Phosphorous Co. In 1927, he became vice-president of the General Material Co., St. Louis, ready-mixed concrete producer. He continued as vice-president and then president until 1948 when he joined the Material Service Corp. to take charge of its ready-mixed concrete operations in the Chicago area. A past-president of the National Ready Mixed Concrete Association, Mr. Thomson is also a former national director of the American Society of Civil Engineers.

Mr. Thomson was awarded the Wason Medal for his paper, "Specifications Should be Realistic," which appeared in the November, 1949, ACI *Journal*. The presentation was made at the recent meeting of the American Concrete Institute in San Francisco. The Wason Award was established in 1917 by the late Leonard C. Wason, ACI past-president, and is given for original research work on a subject relevant to Institute activity and which within the year has been the subject of an Institute paper.

Harry F. Thomson

C. of C. Head

OTIS H. WALKER, owner and operator of the Concrete Products Co., Junction City, Kan., has been elected president of the Junction City Chamber of Commerce. He has been first vice-president during the past year.

Director of Research

C. J. LINE, who has been chief chemist of the Peerless Cement Corp., Detroit, Mich., for the past five years, has been appointed director of research.

Sales Manager

CARL J. KIRCHGESSNER has been appointed sales manager and engineer consultant of the Grand Rapids Gravel Co., Grand Rapids, Mich. A graduate of the School of Engineering at

Carl J. Kirchgessner

the University of Michigan and a registered professional engineer, Mr. Kirchgessner has had extensive experience and training in the development and techniques in the use of concrete and concrete mixtures. For the past four years he has been associated with the Portland Cement Association as district structural engineer, and prior to that he was associated with the Dow Chemical Co., Engineer Division, Commonwealth and Southern Engineering Department, and the Michigan State Highway Department, Bridge Division, where he had charge of concrete design.

Named Vice-President

CEDRIC WILLSON, who has been associated with the portland cement industry for 20 years, has been elected vice-president of the Texas Lightweight Aggregate Co., Dallas, Texas. He was formerly superintendent of the Houston, Texas, plant of the Trinity Portland Cement Division of the General Portland Cement Co., Chicago, Ill. For the past two years he has been associated with the lightweight aggregate industry, and designed and built the Herculite plant at Rosenberg, Texas, for the Texas Lightweight Aggregate Co.

Legion of Honor Member

JOHN VAN NOSTRAND DORR, chairman of the board of directors of The Dorr Co., Stamford, Conn., has been made a member of the Legion of Honor of the American Institute of Mining and Metallurgical Engineers in recognition of his 50 years of service as a member.

Elected President

JESSE L. HENDERSON, secretary-treasurer and assistant manager of the Blue Diamond Corp., Los Angeles, Calif., since 1926, has been elected president to succeed Fred J. Bennett, founder of the company. J. G. Drummond, who has been with the company since it was founded in 1924, has been appointed vice-president, and W. B. Handley has been named secretary treasurer.

O.P.S. Administrator

WALTER H. ACHESON, Somers-Barr Co., Inc., Urbana, Ill., a member of the board of directors of the National Ready Mixed Concrete Association, has been appointed administrator of price controls for the Masonry Materials Division of the Office of Price Stabilization. Mr. Acheson, who is now in Washington, will be responsible for price control of portland cement, lime, sand and gravel, crushed stone, slag,

Walter A. Acheson

ready-mixed concrete, concrete products, etc. He served in a similar capacity in Washington during World War II.

Heads Community Chest

FRANK E. MCCASLIN, president of the Oregon Portland Cement Co., Portland, Ore., has been re-elected president of the Portland and Multnomah County Community Chest. He was chairman of the 1949 Community Chest, and was elected president for the first time in 1950. Mr. McCaslin is a past-president of the Portland Chamber of Commerce and a member of the labor-management committee in Portland which has gained national

Frank E. McCaslin

recognition through its successful efforts in maintaining excellent labor-management relations in the Portland area.

District Manager

MARSHALL JONES, a Bureau of Reclamation engineer with wide experience in the field of water conservation, has been appointed district manager of the Bureau's Sacramento Valley district. He succeeds James K. Carr, who has been transferred to the Washington, D. C., office. A native of Long Beach, Calif., and a civil engineering graduate of the University of California, Mr. Jones joined the Bureau's regional planning staff at Sacramento in 1939, later becoming engineering assistant to Stanley A. Kerr, regional planning engineer, who is now retired. Since 1949, he has served as principal assistant to James K. Carr.

Association President

J. P. BATTERSON, vice-president of The Cunard-Lang Concrete Co., Columbus, Ohio, has been elected president of the Columbus Concrete Block Manufacturers Association. O. H. Seeger, general manager of the Harry Wellnitz Co., Columbus, has been named vice-president, and John F. Royer has been re-elected secretary-treasurer.

Manufacturers' Committee

HARRIS N. SNYDER, vice-president of the Buffalo Slag Co., Inc., Buffalo, N. Y., has been named to the National Association of Manufacturers' committee in cooperation with community leaders.

Re-elect Officers

CHARLES G. SHRINER has been re-elected president of The Cunard-Lang Concrete Co., Columbus, Ohio. J. Paul Batterson has been re-elected vice-president and general manager, and Frederick R. Lang has been re-elected secretary-treasurer and assistant manager. Mrs. Clara Lang and Miss Eva Lang have been renamed directors of the company.

Honorary Members

HARRISON F. GONNERMAN, assistant to the vice-president for research and development, Portland Cement Association, Chicago, Ill., and Frank E. Richart, research professor of engineering materials, University of Illinois, Urbana, Ill., have been elected to honorary membership in the American Concrete Institute.

OBITUARIES

JOHN P. SANGER, vice-president in charge of purchases for the United States Gypsum Co., Chicago, Ill., died suddenly on February 10. He was 53 years of age. A graduate of Armour Institute of Technology, Mr. Sanger started his career with the gypsum company in 1921 in the purchasing department. He had been vice-president since 1936.

FRANK J. HAWKINS, manager of the Newburgh Sand and Stone Co., Newburgh, N. Y., was stricken with a heart attack and died at his office in New Windsor recently. He was 58 years old.

JAMES W. CALLAHAN, production manager of the Gravel Products Corp., Buffalo, N. Y., died March 17 at his home after an illness of several months. He was 62 years of age. Born in St. Paul, Minn., Mr. Callahan was associated with the Superior Products Corp., Detroit, Mich., before joining the Gravel Products Corp.

MRS. SARAH W. DICKEY, wife of Ralph L. Dickey, president of The Kelley Island Lime and Transport Co., Cleveland, Ohio, died suddenly at her home in Shaker Heights, Ohio. She was 52 years old. Mrs. Dickey was born in New York, where she and her husband were married in 1918. They lived in Winnetka, Ill., prior to moving to Cleveland when Mr. Dickey became head of Kelley Island.

HARRY F. JENNINGS, president of the Jennings Concrete Supply Co., Dearborn, Mich., died recently at the age of 64. Mr. Jennings was a former president of the Wabash Portland Cement Co., and a former member of the board of directors of the Portland Cement Association and the Cement Institute.

WILLIAM H. CROOK, sales manager for The J. E. Baker Co., York, Penn., died recently.

Maintenance costs come down when bearings are protected by TEXACO MARFAK

When you use *Texaco Marfak*, your bearings get real protection, and — *the protection lasts!* This tough, tenacious lubricant *stays in the bearings* in spite of heavy loads, the pounding jolts of off-highway service, or puddle splash. *Texaco Marfak* wards off both wear and rust . . . assures longer parts life . . . lower maintenance costs.

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Engines — heavy-duty gasoline or Diesel — run better and more economically when lubricated with *Texaco Ursa Oil X★★*. Its fully detergent-dispersive properties keep engines clean . . . keep maintenance costs and fuel consumption low.

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INDUSTRY News

Uranium from Phosphates

THE ATOMIC ENERGY COMMISSION has announced the development of a process whereby uranium in phosphates can be extracted economically in the production of triple superphosphate. In the production of triple superphosphate, phosphoric acid is produced at one stage. In the production chain, between the phosphoric acid stage and the final stage, it appears to be feasible with the new process to extract uranium from the phosphate by attaching special equipment to the facilities used in the production of fertilizer. The process is classified and cannot be described.

Jesse Johnson, manager of A.E.C. Raw Materials Operations, pointed out that in the production of phosphoric acid, sulfuric acid is used. For this reason, sulfuric acid, available to industry for production of fertilizer, also assists the commission's program for extracting uranium from phosphates as a byproduct of fertilizer production.

Engineers Wanted

INDUSTRIAL MINERALS BRANCH, Defense Minerals Administration, which comes under the U. S. Department of the Interior, is in urgent need of engineers to handle problems pertaining to construction materials such as limestone, cement, and also burned lime and dolomite, in the national emergency.

The applicants should have technical training and experience in industry sufficient to examine and pass on loan and accelerated depreciation applications, and make studies as to production requirements of industry.

Applicants should write directly to James A. Barr, chief, Room 3628 Interior Building, Washington 25, D. C.

To Produce Metallic Calcium

NEW ENGLAND LIME CO., Canaan, Conn., has received government contracts to produce metallic calcium, approximately 99 percent pure, a product which it produced during World War II along with magnesium from dolomite.

There is considerable evidence of growing interest in various applications of calcium. With many basic materials becoming critical and strategic, high in price and difficult to obtain, metallurgists and chemists have been searching for ways to use less critical materials, and many are convinced that some new important uses for metallic calcium might be devised if enough research effort and money are spent. Scientists have already met with some success as indicated by a recent announcement of Bell Telephone Laboratories that they have put into commercial use a new long-life storage battery, in which 0.5 percent calcium replaces 12 percent antimony, which is one of the most critical metals.

During World War II about 500,000 lb. of metallic calcium were produced and converted into calcium hydride, CaH_2, which reacts with water to yield calcium hydroxide and hydrogen. This gas was used by the government to inflate weather balloons and other atmospheric testers. The metallic calcium to be produced by New England Lime Co., is expected to be used for this purpose. Another company to produce metallic calcium is White Metal Rolling & Stamping Co., Brooklyn, N. Y., which in peacetime makes magnesium ladders. As during the second world war, it will roll and extrude metallic calcium into sheets and more complex forms, on a more or less experimental basis.

Simulated Marble from Vermiculite Plaster

ZONOLITE CO., Chicago, Ill., has demonstrated the versatility of vermiculite in its uses as plaster and concrete aggregate, loose fill insulation and acoustical plastic. One of its more recent adaptations is the use of vermiculite plaster to simulate a marble interior, known as Travertine plastering. Travertine marble appears as a colorful, dappled stone, and one of its first uses was in the interior of St. Gerard's church, Great Falls, Mont. Vermiculite plaster was applied over tile on the side walls, and over gypsum lath on partition walls at the front of the church. After the plaster dried, chips were dug out of the walls, with the use of a Travertine brush having steel prongs in the tip. Next, burnt umber was applied to the walls and then wiped off the surface, leaving the burnt umber only in the holes. A clear glaze was then put over the entire surface.

Appearance of marble created through use of vermiculite plaster

Asbestos Mine

ASBESTOS CORP., Montreal, Can., has announced plans to develop a new asbestos ore body at the "Vimy Ridge" mine. In anticipation of this and other capital expenditures, a total of $2,000,000 has been set aside and invested in government bonds. No new ore was added to existing reserves during 1950; in fact, it decreased by 4,383,000 tons, and tonnage mined decreased to 87,750,000 tons.

Buys Lime Plant

NATIONAL GYPSUM CO., Buffalo, N. Y., is acquiring all the capital stock of National Mortar & Supply Co., Pittsburgh, Penn., which operates a lime plant at Gibsonburg, Ohio. National Gypsum's finishing lime capacity will be doubled by the transaction. Melvin Baker, president of National, also disclosed that the company has been selected to manage the Nebraska Ordnance plant at Wahoo, Neb., a bomb-loading operation.

Cement Allocations Again

CALAVERAS CEMENT CO., San Francisco, Calif., recently announced that because of increased government demands for cement, it has been forced to institute an allocation system of non-government shipments, effective immediately.

The announcement was made by H. C. Maginn, vice-president and chairman of the company's management committee, at a meeting of company salesmen. Mr. Maginn stated that every effort would be made to provide its customers with a fair and equitable distribution of cement after government requirements had been met. He recalled that heavy demands led to shortages during 1950 and that everything points to a continued tight situation during the rest of 1951. Mr. Maginn further stated that the company is in the midst of a plant expansion program which is expected to result in larger shipments than ever during 1951 and 1952.

Lone Star Lets Contracts

LONE STAR CEMENT CORP., New York, N. Y., has awarded the contract for 15 storage silos, 8 raw-mix silos and a storage building for its Sweetwater, Texas, plant to Walsh Construction Co. and Gifford-Hill Co., Inc. Estimated cost of the construction is $1,310,000, $710,000 and $490,000 respectively.

Files Injunction

DUQUESNE SLAG PRODUCTS CO., Pittsburgh, Penn., has filed an injunction against the State Department of Highways, relative to bidding on slag and stone as aggregates for concrete pavement. For many years the highway department stipulated that 87 tons of slag are equal in volume to 100 tons of stone. Due to the lighter weight of slag, bids were obtained on that basis. However, last year this practice was ruled as illegal and the state obtained bids on a ton for ton basis. The Duquesne company is seeking an injunction to compel the return to the former bidding method.

Defense Orders for Machinery

THE GOVERNMENT HAS limited the amount of defense orders that makers of construction machinery must accept. The ceiling will be based on average monthly shipments in the first half of 1950. The National Production Authority told construction machinery manufacturers that from now on they don't have to accept "DO" orders for over 50 percent of their average monthly shipments of the first half of 1950. However, N.P.A. warned that at any time, the amount of essential or military orders the manufacturer must fill may be increased (under order M-43) as government-sponsored programs calling for substantial amounts of construction machinery are approved. The agency also informed the manufacturers that they will be given 45 days to fill "DO" orders.

Some of the machinery affected by N.P.A.'s order includes portable air compressors, conveyors, crushers, screens, concrete mixers, pavers, dredgers, large shovels, air drills, pumps and tractors.

Quarter Century Club

THE CHANUTE, KAN., plant of Ash Grove Lime & Portland Cement Co., Kansas City, Mo., recently announced that eight more of its employes have joined the Ash Grove Quarter Century Club, bringing the Chanute membership to a total of 52. Total membership throughout the entire Ash Grove organization is 77. The club was organized in 1937, and to be a member, an employe must have served the company continuously for 25 years. A. B. Sunderland, company president, gave each member an album of active members and a special Christmas bonus representing $1 for each year of employment.

Missouri Limestone Producers Association, Jefferson City, Mo., has listed, by county, 1951 Missouri agstone prices, delivered and spread per ton. The prices were approved by P.M.A. Key to the above map is as follows: C.—contract; P.O.—purchase order; and S.W.—statewide

Cement Plant for Brazil

A NEW CEMENT PLANT to be built at Salvador, Bahia, Brazil, will have a capacity of 100,000 tons annually, as recently reported in *Cement and Lime Manufacture*. Large deposits of decomposed coral are available in the area. Natural gas will be used as fuel.

Coming Conventions

April 27-28, 1951—
Northwest Industrial Minerals Conference, Congress Hotel, Portland, Oregon.

April 30-May 4, 1951—
Materials Handling Exposition, International Amphitheatre, Chicago, Ill.

May 16-18, 1951—
National Industrial Sand Association, 16th Annual Meeting, The Homestead, Hot Springs, Va.

May 24-26, 1951—
National Lime Association, 49th Annual Convention, The Homestead, Hot Springs, Va.

Portland Cement Production

THE PORTLAND CEMENT industry produced 19,116,000 bbl. of finished cement in December, 1950, as reported to the Bureau of Mines. This was an increase of 13 percent compared with the output in December, 1949. Mill shipments totaled 12,477,000 bbl., an increase of 7 percent over the December, 1949, figure, while stocks were 11 percent below the total for the same month in 1949. Clinker production during December, 1950, amounted to 20,180,000 bbl., an increase of 10 percent compared with the corresponding month of the previous year. The output of finished cement during December, 1950, came from 150 plants located in 35 states and Puerto Rico. During the same month of the previous year 16,967,000 bbl. were produced in 149 plants.

Company Reorganizes

M. O. WEAVER, INC., Des Moines, Iowa, which has operated quarries in Iowa and other states for several years, has been reorganized, according to E. W. Knapp, president.

Stone quarries at Alden, Iowa, and a ready-mixed concrete plant at Webster City, Iowa, will be owned by Wood W. and Robert R. Weaver of Iowa Falls, and operated under the name of Weaver Construction Co. The stone quarry at Fayette, Ohio, will be owned by Paul Templeman of Fayette and operated under the name Fayette Stone Co. Mr. Knapp will continue bituminous paving contracting and other quarry work of the company under the name of M. O. Weaver, Inc.

Shown on packhouse loading platform discussing shipment of 1,000,000th bbl. of cement are, left to right, Marshall Clements, sales manager; A. J. Anderson, works manager, and Ellroy King, vice-president

Halliburton Produces First Million Barrels of Cement

HALLIBURTON PORTLAND CEMENT CO., Corpus Christi, Texas, recently produced its 1,000,000th bbl. of Shell Brand cement. A brief ceremony of the occasion also marked the 10th month of operation of the plant. Since April 1, 1950, the Halliburton plant has been producing regular portland and Type II portland cement, with some High Temp Oil Well cement scheduled to be produced some time this year.

Much of the cement produced in the immediate future, according to vice-president Ellroy King, is expected to be used for extensive Naval Air Force projects in that area. The Falcon dam on the Rio Grande south of Laredo will also use many barrels of Halliburton cement.

Materials Handling Conference

THE MATERIALS HANDLING CONFERENCE is to be held concurrently with the National Materials Handling Exposition, April 30-May 4, 1951, at the International Amphitheatre, Chicago, Ill. The conference, which is to be the most extensive ever undertaken, is being sponsored by the American Material Handling Society. Among topics to be discussed are: "Bulk Handling and Storage Methods for Solids"; Yard Handling Methods for Pipe, Structural Steel and Odd Shapes"; "Ways to Beat Wet Grounds and Bad Weather in Yard Handling," and "Incoming Raw Materials and Components." Also, three sessions are to be devoted to unit loading and packaging methods, and other sessions will include a discussion of fundamentals, methods of making a materials handling survey, and receiving and shipping methods.

The exposition, which is being sponsored by the Material Handling Institute, will be conducted by Clapp & Poliak, Inc. The six acres of exhibits and the outdoor area of four acres will comprise an extensive display of cost-reducing handling equipment in operation.

Association Meeting

PENNSYLVANIA SAND & GRAVEL ASSOCIATION held its annual meeting, January 25, 1951, at Harrisburg, Penn. All officers were re-elected. They are J. P. Eyre Price, Scranton, president; William S. Giles, Pittsburgh, vice-president; Ray V. Warren, Pittsburgh, secretary-treasurer, and H. Hershey Miller, New Cumberland, executive secretary. Directors of the association are Lewis Struble, Alex Foster, Jr., Philadelphia; J. Allen Heim, Montoursville; Charles A. Smith, Oil City, and C. S. Wicker, Buffalo, N. Y.

Projected Cement Plant

WHITLOCK MINING CO., Los Angeles, Calif., has made application for a $15,000,000 federal loan for the development of a limestone deposit near Lake Hemet in the San Jacinto mountains and the building of a cement plant somewhere in the Hemet-San Jacinto valley. John H. Whitlock, president of the company, said the project is unusual in that the limestone quarry in the mountains and the cement plant on the floor of the valley would be connected by a 12-in. steel pipe, 15 miles long, through which pulverized limestone would be floated in water.

Safety Achievement

EASTERN ROCK PRODUCTS, INC., Utica, N. Y., has won a 100 percent award for completing the plant safety contest of Associated Industries of New York State without a lost-time accident.

Opens Quarry

HILDEBRAND QUARRIES CO., Astoria, Ore., has acquired a new quarry site near Vernonia, giving the company a total of three sites. The other two are in Clatsop county, in the Olney area. Arthur Hildebrand, president of the company, said quarrying equipment will be moved from site to site as needed to fill orders for crushed rock.

Asphalt Research

FRANKLIN INSTITUTE Laboratories for Research and Development has announced the organization of a national asphalt research center to serve the asphalt industry in the United States. The research center will be located in Philadelphia, Penn.

Kelley Island Expands

KELLEY ISLAND LIME & TRANSPORT CO., Cleveland, Ohio, reports that according to present indications, its fluxstone shipments to the steel industry in 1951 will be the largest in the company's history. Ralph L. Dickey, president, stated that January shipments were substantially greater than earlier months. Shipments of materials for the construction industry continue close to capacity operations and are expected to remain at high levels unless construction is more drastically curtailed than appears likely at this time.

Another step in the company's progress is the development by the company's research department of an incombustible tile (Kilnoise) which has had a satisfactory market reception. A plant at Columbus, Ohio, to produce the tile in commercial quantities, is nearing completion and is expected to be in operation soon.

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of December and for the entire year, 1950, have been announced by the Portland Cement Association as follows:

	Square Yards During December, 1950	Awarded During Year, 1950
Roads	$2,064,790	$28,330,381
Streets and alleys	1,645,284	27,023,159
Airports	28,271	3,174,771
Total	$3,738,345	$58,528,311

Awards for the month of January, 1951, were:

Roads	$3,198,842
Streets and alleys	2,251,662
Airports	199,911
Total	$5,650,415

HINTS and HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Concrete Highway Markers

THE ILLUSTRATION below shows a type of highway marker now finding an extensive use. The posts are of concrete and measure about 6 in. in diameter at the top and approximately 8 in. at ground level. They are about 30 in. high and are reinforced with a piece of ½-in. reinforcing steel, forming an "eye" to expedite handling of the units.

Concrete posts, reinforced with steel, are used as highway markers

Double lane or divided highways in some sections of the West are veering in a direction whereby two traffic lanes are separated 50 or more feet, with the space between being landscaped.

There are various miscellaneous types of concrete products like this which could easily be manufactured by enterprising concrete product producers, or be made by ready-mixed concrete producers from excess concrete returned to the plant in the mixing drums.

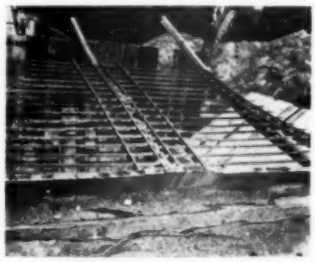
Dryers Increase Production

AN EASTERN LIMESTONE OPERATION was encountering difficulty in putting damp, bank-run or stockpiled limestone through its mill for the production of agricultural limestone. The damp material was causing undue screen wear and the capacity of the plant was seriously hampered by clogging and blinding. Also, the end product retained a high percentage of moisture, making it difficult to handle from spreaders. The company solved its problem by the installation of a Barber-Greene Model 830 dryer. The dryer, which has a rated capacity of 15 to 30 t.p.h., depending upon the moisture content, speeded up production almost 100 percent as a result of easier handling of dry material. Also, repair costs on the pulverizer were greatly reduced, as was the horsepower requirement of the entire plant.

A midwestern operation was having a similar problem. In its normal crushing and screening operations, it produced daily a considerable quantity of ¼-in. screenings. About 10 tons per hour could be put through the pulverizer for reduction to dust for such end uses as mineral filler in asphalt construction, paper coatings, etc. However, the hourly supply considerably exceeded the capacity of the pulverizer and the oversupply was stockpiled. Once this stockpile became wet as the result of rains, it was considered useless as it could not be put through the mill in its damp condition. This company also solved its problem by the installation of a dryer—similar to the one mentioned above, but being slightly larger and of higher capacity. This dryer is making it possible to profitably reclaim the entire stockpile of 50,000 tons, which otherwise would have been totally lost.

Grizzly From Old Fence

AT AN OHIO OPERATION, where the deposit being worked is a loosely consolidated sandstone, an efficient grizzly has been made out of two cast-off fence gate sections from a nearby college. The ¾-in. steel bars are about six in. apart.

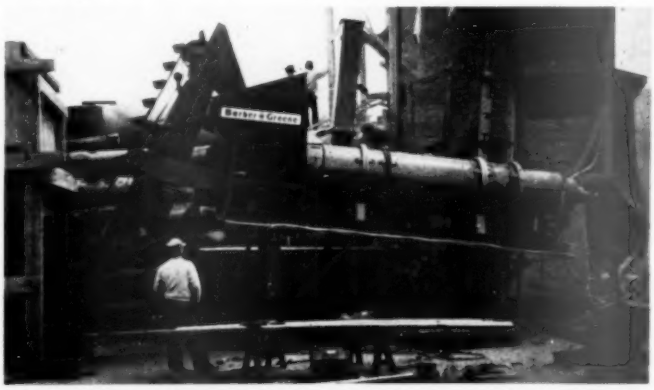


Fence gate sections used as grizzly

"Rainmaker" Pipe

AT A LARGE HYDROELECTRIC construction project near Bishop, Calif., which covers an area of about 14 miles, considerable portable equipment is necessary to service the aggregate production set-up. To obtain water from the nearby high Sierra Nevadas for the plant, a so-called "rainmaker" pipe is being used to some extent. This pipe is light weight and each joint is provided with a cam of such arrangement that the slip joints can be quickly assembled or disassembled as the case may be. The illustration shows three parallel "runs" of the pipe with the quick-assembling mechanism. At the female end of each joint a ¾-in. outlet has been welded. This lightweight pipe is 3 in. in diameter and 20 to 22 ft. long and one length can easily be carried by one man. The pipe is being used in many irrigation projects throughout the West and its adaptability for either air or water usage is being recognized throughout the rock product industries.

Portable pipe with cam arrangement at slip joints provide means of conveying water to plant

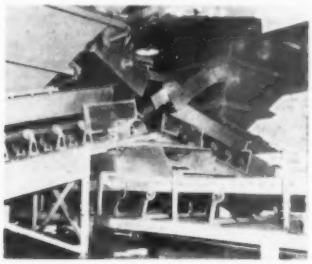


Shown above are: truck dumping hopper (left); elevator from hopper to charging end of dryer; the dryer, and (in rear) the bucket elevator which carries dried limestone to pulverizer

Sand to Blending Belt

THE ILLUSTRATION BELOW shows the arrangement of chutes and feeder belts used at a western operation for delivering sand to the main blending belt running under and parallel to the main bin structure. Short, inclined cross belts deliver the sand to the main, flat-running belt.

At first, this operation used a series of parallel, heavy-duty screw conveyors for transferring the sand, but



Inclined cross belts deliver sand to main flat-running belt

after a trial period the screws were abandoned in favor of the short cross belts. Another thing to note in the illustration is the small auxiliary chute over the cross belts.

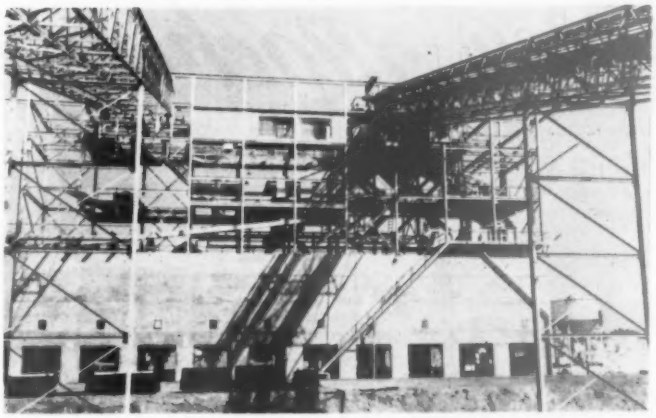
Temporary Reclaiming Tunnel

WHERE A TEMPORARY RECLAIMING TUNNEL is needed for aggregate, one built of wood has the advantage of low construction cost and can also be quickly assembled. The reclaiming

A temporary reclaiming tunnel made of wood is economical and easy to construct

tunnel shown in the illustration is one of laminated wood construction. The structure is at ground level and extends under four sizes of coarse aggregate and under three sand piles. The reclaiming belt is operated from inside the tunnel.

Many state laws require that all underground structures (tunnels, mines, shafts, etc.) must have two outlets, and this type of tunnel easily complies with such requirements.



Steel bin feeds fine sand to blending belt

Blending Fines into Sand

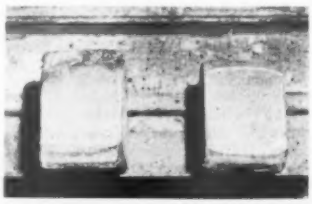
IN THE ILLUSTRATION ABOVE, the cylindrical steel bin at the extreme right of the main structure is not a field hopper as it may first appear, but is a supply source for feeding very fine sand to a blending belt that runs under the long axis of the main structure.

The cylindrical bin is provided with a suitable feeder so that controlled amounts of fine dry sand can be introduced into the system. The hopper is filled by a clamshell rig. Where concrete sand is deficient in the minus 100- and minus 200-mesh material, this is one method of making up the deficiencies.

Hard Facing Worn Hammers

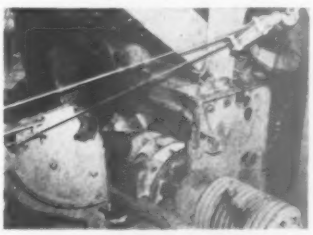
TOBIN QUARRIES, INC., Kansas City, Mo., at its Alexandria, S. D., plant, is producing crushed stone from a deposit which presents a difficult maintenance problem on equipment due to the highly abrasive nature of the stone. The stone is a quartzite containing from 95 to 98 percent silica.

Nearly all the production from the plant currently is for the contractors building Fort Randall dam for which three sizes of crushed stone are produced. They are 3- to 1½-in., 1½- to ⅜-in. and minus ¾-in. to No. 4 sizes. Capacity of the plant is about 250 t.p.h. and by-products are the finer sizes which are sold for asphaltic pavement and concrete purposes.



Top view of worn and rebuilt mill hammers; hammer at the left was rebuilt with hard facing

Crushing equipment consists of a 30-in. primary gyratory crusher and reduction is accomplished by 4½-ft. and 5½-ft. cone crushers and by hammermills. Hammermills, which are subject to the greatest rate of wear, are used at this plant because they yield a product of cubical characteristics as required by specifications on the government contract.



View of hammermill showing hammers and extent of wear after ½ day's operation

Hard facing is employed extensively throughout the plant, including the building up of shovel bucket teeth, cone crusher liners and mantels and, most importantly, for building up hammers in the hammermills. Manganese steel hammers are operated within the range of speed of 500 to 700 r.p.m. and must be rebuilt and hard faced at the end of each 10-hr. day. Without hard facing, a new hammer would last about one hour in crushing this quartzite.

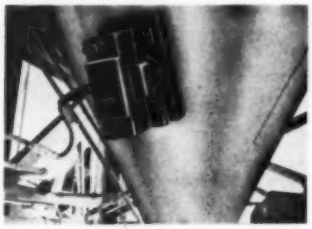
An idea of the severe conditions is gained from the fact that two welders are on full-time just to rebuild worn hammers. They are brought back to dimensions with Stoody manganese and hard faced with Stoody Self-Hardening 21. Cone crusher mantels and liners are hard faced with the same hard-facing rod and then overlaid with Stoodite.

New Machinery

ROCK PRODUCTS

Electric Vibrators

SYNTRON Co., Homer City, Penn., has announced the addition to its line of bin, hopper and chute vibrators, of Semi-Noiseless of the larger sizes. It is said that these vibrators perform the same function as the standard

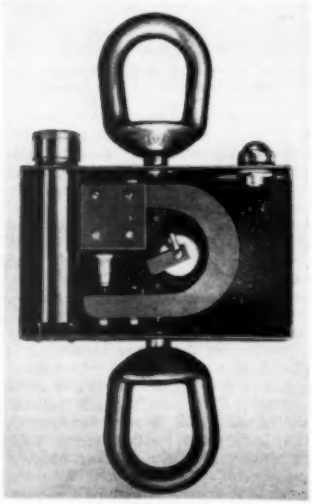


Large size vibrator

models, but with a sharp reduction in operating noise, due to the elimination of metallic striking parts and the substitution of rubber bumpers. Four sizes are available, and all are furnished with the company's variable vibration controllers to regulate the intensity of vibration.

Overload Signal

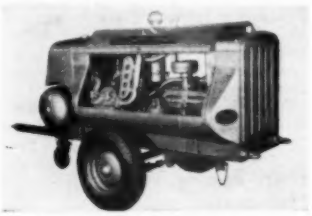
W. C. DILLON & Co., INC., Forest Park, Ill., has designed an overload warning signal said to protect hoists and cranes as well as the life of the operator. The manufacturer claims that for those installations where it is not desirable to cut into the hoist motor circuit but where some method of overload warning is essential, this self-contained unit offers a solution. Setting is made for any point between 500 and 10,000 lb. by means of the load setting screw. Should this load be exceeded in service, the red lamp lights up, and a shrill signal is emitted by the klaxon.



Interior details of warning signal

Portable Air Compressor

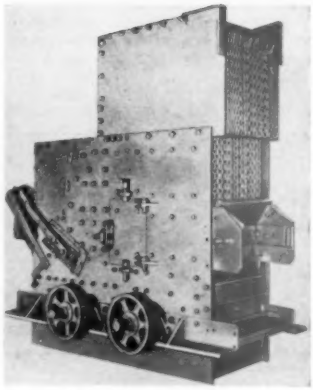
HERCULES MOTORS CORP., Canton, Ohio, has announced that the Gardner-Denver Model WH-105 two stage, portable air compressor is powered by the Hercules QXD-5 gasoline engine. It is a 6-cyl. engine with a 2-7/16-in. bore, a 4⅛-in. stroke, and a piston displacement of 230 cu. in. It is said that the crankcase and cylinder block are cast integral to insure perfect alignment of crankshaft bearings and cylinder bores, and that the high-compression, high turbulence cylinder head assures maximum power and operating economy. The portable compressor is of two-stage design. Air is compressed to 28 lb. in the first stage, cooled back almost to atmospheric temperature in a radiator-type intercooler, and boosted to final discharge pressure in the second stage. This model is furnished on two- or four-wheeled spring mounted running gears and also on wood skids for truck mounting.



Gasoline engine powered compressor

Impact Breaker

PETTIBONE MULLIKEN CORP., Construction Equipment Division, Chicago, Ill., has produced a heavy-duty impact breaker, called the PMCO Impact Master. The machine features an operating principle which is said to control the breaking operation and direct the flow of material to produce a highly uniform gradation cubical aggregate. The manufacturer states that other features are high ratio of reduction, low horsepower per ton of finished aggregate, easy access to all parts and large volume production with minimum plant investment. The impact breaker, designed for use in open or closed circuits for producing aggregates for road building and concrete construction, is adjustable for the simultaneous production of agricultural limestone. Capacities range up to 500 t.p.h.



Heavy-duty impact breaker

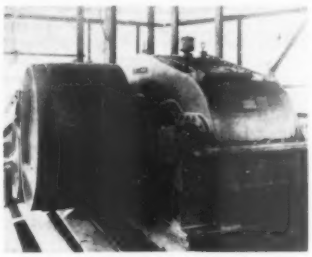
Fine Particle Classifier

HARRY W. DIETERT CO., Detroit, Mich., has announced production of a classifier for the measurement of size and amount of fine particles. This classifier, it is said, will separate mixed particles into eight fractions from 0 to 60 microns plus oversize residue in two hours, and may be applied to any type of material such as drugs, chemicals, dusts and powders. The sample may be as small as 10 g.

Classifier for separation of microparticles

Conveyor Drive

NATIONAL IRON CO., Duluth, Minn., has developed a new conveyor drive which uses an overhung driving pulley, eliminating the conventional head shaft and its bearing, as well as the low-speed coupling or chain drive. The manufacturer states that this makes possible considerable savings in installation and maintenance costs. The company's design uses a special speed reducer built by the Westinghouse Electric Corp. It is equipped with an extra large gear shaft and special anti-friction bearings which are said to provide the extra capacity necessary for overhanging the driving pulley.



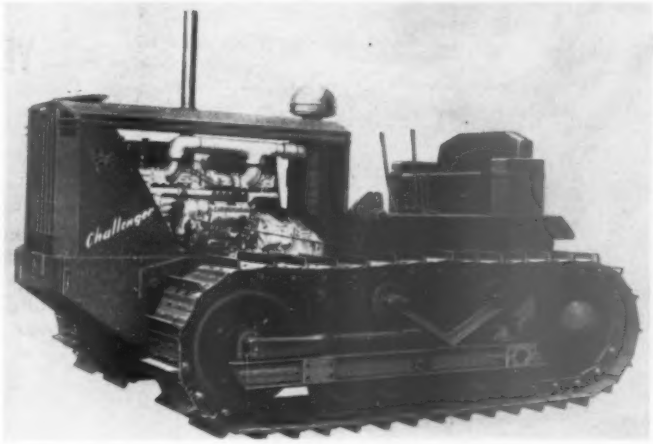
Drive with overhung pulley

Pallet Racks

AMERICAN METAL PRODUCTS CO., Detroit, Mich., has added new design prefabricated pallet racks and shelves to its line, which are said to eliminate bolting or welding in joining beds and uprights and may be dismounted without cutting. The manufacturer states that disassembly is as convenient as installation because it is done simply by unlocking the channels from the tubular uprights. Racks may be tiered to any height desired, and are available in five standard rack sizes.

There is a variety of optional deck material for the shelf surface, including sheet steel, plywood and board.

Prefabricated pallet racks and shelves



Diesel crawler tractor

Rotary Filter

OLIVER UNITED FILTERS INC., New York, N. Y., is manufacturing a horizontal rotary filter, said to be especially suited for cleaning foundry sand, and for filtering operations involving the washing and dewatering of coarse solids contaminated with fine waste material, organic or inorganic. The filter is available in sizes ranging from 10 to 165 sq. ft. of filter area and from 4 to 15 ft. in dia., and manufactured in stainless steel, steel and lead-protected.

Filter for cleaning foundry sand

Arc Welding Electrode

AIR REDUCTION, New York, N. Y., has announced that thoriated tungsten, used in electronic tubes, is available as a non-consumable electrode, Thor-Tung, for Heliwelding, the company's inert-gas shield-arc welding process. It is said that Thor-Tung runs cooler and does not become molten, thus permitting the use of high currents.

Rayon Bags

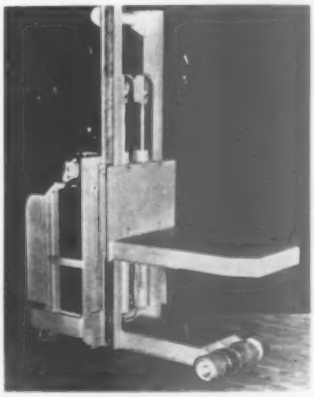
CHASE BAG CO., Chicago, Ill., has added rayon cloth, a new material in the bulk packaging field, to its regular line of textile bag products. It is said that rayon, a strong and smooth material, offers an excellent printing surface for direct multicolor brand printing, and that the material itself provides a valuable cloth premium for thrifty home use.

Tractor Line Available

JOHN M. H. SHLINE CO., New York, N. Y., United States representative and distributor for equipment produced by John Fowler & Co. (Leeds) Ltd. and Marshall Sons & Co. Ltd., both of England, has announced that their lines of crawler tractors are available for prompt delivery. The photograph is of a large Fowler tractor but the crawler line ranges from 95 hp. down to 20 hp.

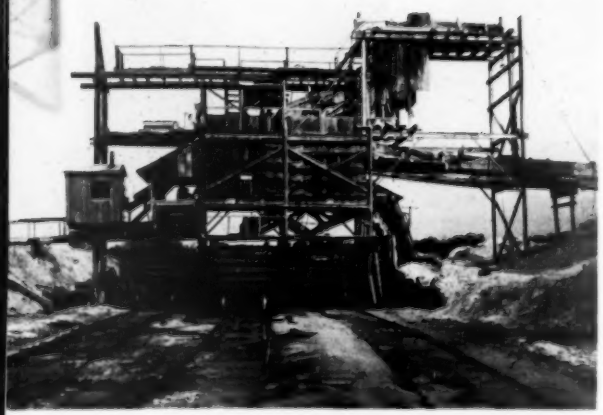
Stacking Truck

LYON-RAYMOND CORP., Green, N. Y., has announced the expansion of its SpaceMaker line to include a 4000-lb. capacity model for stacking and tiering skids. The new truck is available



Truck for tiering skids

with a standard 24-in. wide platform with lengths from 30-48 in., and with a lowered height of either 7 or 11 in. It is said that the space saving feature of the unit allows it to stack at right angles from aisles only 24 in. wider than the load length.



Top: New storage and transfer yards are currently being provided for the handling of sand and shell on the Industrial Canal. Center: This dredge is used for excavating concrete and mason sand. Below: Loading tipple at Bluff Creek hydraulic sand and gravel plant with daily capacity of 100 carloads

75 YEARS IN BUSINESS

Jahncke Service has developed widely diversified operations in aggregates, shell, concrete, building supplies and dredging over three-quarters of a century

By BROR NORDBERG

PRODUCERS OF SAND and gravel and ready-mixed concrete who attended the national conventions of their industries in New Orleans, La., this past February will long remember the event as a productive convention and a delightful experience. It was such a complete success because of the personal efforts of Herbert G. Jahncke, vice-president of Jahncke Service, Inc., and the efforts of his company in providing unparalleled arrangements for the enjoyment of all.

The name "Jahncke" soon became a familiar word to those who had time to travel around the city of New Orleans. They saw the name along the New Basin Canal where tremendous piles of clamshells and sand were stored, they saw it on ready-mixed concrete trucks serving large construction projects and they observed distribution outlets for building materials bearing the name at various locations. Many producers at the convention expressed surprise because of the obvious great use being made of clamshells by the construction industry, and amazement at the apparent diversity of Jahncke interests. There was an obvious curiosity about the company and how it functions, which is the reason this article is published in the same issue of ROCK PRODUCTS which reports the conventions proceedings.

Jahncke Service, Inc., celebrated its seventy-fifth year in business this past year and the event was commemorated by a beautiful bound brochure from which we have drawn for much of this article in presenting the historical background, development of the company and present-day operations. Jahncke Service is an $8,000,000 per year enterprise and its activities today are in four major fields generalized as follows:

(1) Activities relating to manufacturing and/or distributing, selling and delivering, in the New Orleans area, a wide variety of general and special building materials.

(2) Activities related to producing, selling, and distributing sand, gravel and shell in carload and bargeload lots; and by trucks for roads, bridges, buildings and other construction.

(3) Activities related to water transportation of sand, shell and gravel which covers operation of a fleet of tugs and barges as well as operation of a maintenance and ship repair plant at Madisonville, La.

(4) Hydraulic dredging for harbors, levees, canals and land rehabilitation.

The company is a large producer of ready-mixed concrete, concrete pipe, aged lime mortar, plaster, and it handles, as a dealer, the products of many leading producers in the rock products industries. Its sand and gravel operations include inland production as well as the reclamation of marine sands for special use. These various activities will be covered later in this article.

Historical

Jahncke Service, Inc., has had a growth paralleling and contributing to the growth of New Orleans and the name "Jahncke" is widely known throughout the entire South. It started with Fritz Jahncke who came to the United States from Germany at the age of 19 to follow his trade as a mason. He was employed by John Schillinger of New York City, holder of the original patent for "Schillinger pavement," and was sent to New Orleans in 1872 to supervise several sidewalk contracts.

In 1875, when the contract work was finished, Fritz Jahncke decided to go into business for himself and acquired the property that today houses the modern offices of Jahncke Service. His early activities in paving work were instrumental literally in lifting New Orleans out of the mud and there are serviceable sidewalks made of cement, sand and shell in New Orleans today that still bear his name. He settled in New Orleans at a time when most of the streets and sidewalks were mud-top, flanked by open stagnant-water ditches.

New Orleans is built on a silt soil, on land just a few feet above the Gulf of Mexico level so there is no stone available for aggregates. As a result, prior to 1880 the only aggregates available for concrete were shells transported by schooners from shell banks bordering Lake Pontchartrain, and building sand from the Gulf Coast. These materials were barged through the New Basin Canal into the heart of New Orleans. Hand shovels and wheelbarrows were used for digging and handling to and from the schooners.

Fritz Jahncke brought in a 10-in. steam-driven hydraulic dredge from St. Louis, which was entirely new to New Orleans, and eventually discovered a high grade sand which he excavated from the Tchefuncta river. He then branched out to the handling of building materials including sewer pipe, brick and lime. He imported flagstone and Dyckerhoff cement from Germany and Crown cement and granite block from Belgium.

Then came the establishment of the shipyard at Madisonville, La., on the Tchefuncta river across Lake Pontchartrain from New Orleans because of the need for barges and tugboats in the transportation of sand and shell. As the fleet was built up, tugs and barges for transportation soon made the schooners obsolete. A schooner would require a round-trip of a week to deliver 75 or 80 cu. yd. of sand or shells into New Orleans, whereas the dredge could load a 200 or 300 cu. yd. barge in a few hours and the round-trip be completed in 1½ to 2 days. Today, with 500-cu. yd. capacity barges, diesel-powered tugs and mechanical handling, a round-trip is completed within 24 hr.

Entry into the gravel business was at Bogalusa, La., where a dredge was built to supply the aggregate needed in the building of the world's largest sawmill by the Great Southern Lumber Co. Later, Fritz Jahncke established a gravel plant at Columbia, Miss., and at Sun, La., for shipment by rail to New Orleans. Then, still later, he barged sand and gravel from islands in the Mississippi river.

Top officials of Jahncke Service, Inc. Top: President Paul F. Jahncke, left, and vice-president Paul F. Jahncke, Jr. Below: Herbert G. Jahncke, vice-president, left, and secretary-treasurer George J. Becker

He established storage yards and business locations on the banks of the New Basin Canal and is given credit for developing the canal as a commercial waterway. Jahncke Service has been the largest and principal user of the canal for 50 years and it is sometimes referred to as "Jahncke's Ditch." The reason was apparent to producers attending the conventions.

Dredging activities of Fritz Jahncke expanded, following success with the first one, and became the important factor in providing fill in the development of the Port of New Orleans and in channel maintenance at the docks. He was credited with building the first shell road of any consequence in the area.

When Fritz Jahncke passed on in 1911, the business was left in the hands of his three sons, Ernest, Paul and Walter. Paul F. Jahncke succeeded Ernest Lee Jahncke as president in 1929 and is president of the company today.

Shipbuilding

During the first World War, Jahncke Service was called upon to build ships and the small shipyard at Madisonville was expanded tremendously for the purpose. In 1917, a contract was entered into with the United States Shipping Board Emergency Fleet Corp. for the construction of 12 wooden 3500-ton ships and 12 steel ships of 5000 tons. As many as 2000 men, with a weekly payroll of $80,000, were employed at Madisonville.

In 1919, Jahncke Dry Dock & Ship Repair Co., Inc., was organized and a contract was entered into with the government for construction of a floating dry dock and other facilities at a cost of $3,600,000, partially financed by the government. Two dry docks were built and a repair plant of capacity to service the largest ships entering the port. This company was discontinued in 1931. After the sale of equipment, there remained an indebtedness, amounting to about $2,000,000, which has since been paid in full.

Building Materials Division

Foundation for the present Building Materials Division was laid by Fritz Jahncke before the turn of the century, and warehouses were built for the purpose at strategic locations. Since that time, a number of warehouses and materials yards have been established. Since 1912, the warehouses at South Claiborne Ave. and the New Basin Canal have been the

Main ready-mixed concrete plant at Claiborne yard has capacity of 1000 cu. yd. per day.

Partial view of concrete pipe plant and yard

main yard and heart of operations.

In the early days, horse-drawn wagons were used. The first truck was a 5-ton Pierce Arrow. The fleet of trucks for this division alone now numbers approximately 40 trucks.

Today, the Division uses more than 50,000 sq. ft. of warehouse floor space and stocks and sells hundreds of building material products in a line covering everything from foundation to roof of a structure. Among the list are sand, gravel, shell, cement, lime, plaster, lumber, nails, brick, concrete block, tile, clay products, reinforcing steel, channel iron, wallboard, paint, roofing, insulation, glass block, asbestos siding, refractories, waterproofing, etc.

Jahncke is distributor for some 60 prominent manufacturers. Among those in the rock products and concrete products industries are Alatex Concrete Products Co., New Orleans; Celotex Corp., New Orleans; Dolcito Quarry Co., Birmingham, Ala.; Ideal Cement Co., Mobile, Ala.; Keystone Lime Works, Inc., Keystone, Ala.; Lone Star Cement Corp., New Orleans, La.; Louisiana Concrete Products Co., Baton Rouge, La.; Longview Lime Corp., Birmingham, Ala.; Medusa Portland Cement Co., Cleveland, Ohio; Mississippi Lime Co., Alton, Ill.; National Cement Co., Birmingham, Ala.; Southern Cement Co., Birmingham, Ala.; Southern Zonolite Co., Atlanta, Ga.; Texas Construction Material Co., Houston, Texas; U. S. Gypsum Co., Chicago, Ill.; and Woodstock Slag Co., Birmingham, Ala.

While Jahncke Service discontinued the import of foreign cement many years ago, it is of interest that the import of Dyckerhoff cement was resumed recently because of the cement shortage.

Ready-Mixed Concrete

The first ready-mixed concrete plant was established in 1930 at the Claiborne yard and the early deliveries were made in dump trucks. Paving of New Orleans' famed thoroughfare Canal Street, was one of the early jobs. "Bathtub-type" agitator bodies were acquired in 1931 and, in 1937, the first drum-type mixer was purchased. It was then that a modern central-mixing plant was built. That plant has a capacity of 1000 cu. yd. of concrete per day and the fleet now numbers about 40 trucks of 2- to 6-cu. yd. capacity.

A second plant, of 500-cu. yd. daily capacity, was built in 1938 on Paris Avenue and, in 1948, the 500-cu. yd. capacity plant at Southport was established. A well-equipped laboratory is operated at the Claiborne plant for quality control.

Mortar-Concrete Pipe

High-grade sanded lime mortar was made available to the building industry when a Brooks-Taylor lime putty plant was built in 1937 at the Claiborne yard. Mortar from this plant has been used since on practically all the major building projects in New Orleans.

A lumber yard was established in the 1920's and now handles more than a million feet of lumber per month. A concrete pipe plant was acquired at Southport in 1928 and production was expanded immediately. The program of improvement and expansion included installation of a McCracken pipe machine to make pipe from 4 in. to 10 in. in diameter in 3-ft. lengths and 12- to 30-in. diameters in 4-ft. lengths. A Champion drain-tile machine was also installed to quadruple production of drain tile. Large sizes of pipe are manufactured by pouring concrete from ready-mixed concrete trucks into forms. The plant produces in excess of 10,000 tons of concrete pipe annually (1949 figure) in sizes from 4 to 48 in.

The Crescent Wall Plaster plant was established in 1923. It is the only plaster mill in Louisiana and the only prepared-plaster mill in the South. It produces prepared plasters, interior color finishes, exterior color stuccos, dry sand and a waterproof cement paint.

Jahncke Service has the exclusive franchise to rent and sell Safeway Steel Scaffolding in the state of Louisiana and the Gulf Coast area.

The Claiborne yard is the main operating base for a fleet of trucks numbering in excess of 100. A crew of 22 mechanics and helpers is required in the repair and maintenance of trucks.

Herbert G. Jahncke, vice-president of Jahncke Service, Inc., is executive director of the Building Materials Division and W. Grant Jahncke is sales manager.

Aggregates

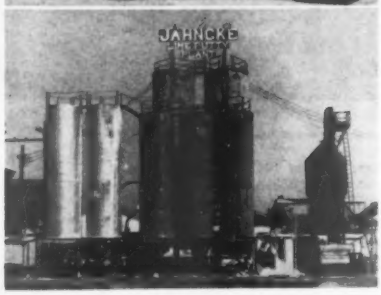
Dredging of clamshells and reef shells from Lake Pontchartrain for the manufacture of chicken feed was a principal activity prior to 1920. The shells were crushed and sacked for distribution throughout the South and the Middle West. Then came their use for secondary roads. The use of shell in the highway system has since become widespread. The use of shell has been included in the asphalt and macadam road systems with success.

A number of bulk material yards were established, using the latest in mechanical handling equipment, and at present a new yard and receiving point is being developed along the industrial canal, necessitated by the closing and filling of the New Basin Canal.

The early sand and gravel plant at Sun, La., had a capacity of eight carloads per day and was abandoned after a few years because of the fact that the gravel generally was too small for good concrete aggregate. Production was doubled at the Columbia, Miss., plant and then, after ceasing operations, a larger plant was operated at Jackson, La.

A plant with a capacity of 35 carloads of washed gravel was later built, other operations being abandoned, at Roseland, La., and great tonnages from this operation went into paving ballast and general construction in New Orleans.

The next step was acquisition of gravel-bearing property near Brookhaven, Miss., on the main line of the Illinois Central Railroad, and building of a plant primarily designed to produce unwashed sand-clay-gravel ballast and road topping. Loading was done by steam shovels into cars and



Above: Central mixing plant at main yard is here loading 6-cu. yd. truck mixer. Below: Sanded lime mortar is produced at this lime putty plant

a production capacity of several hundred cars per day was attained.

On one day, in 1915, more than 1000 carloads were loaded out of the Brookhaven plant, which was without question one of the largest, if not actually the largest, operations in the United States. It was operated for a number of years in conjunction with the Roseland plant and then it was equipped to produce washed concrete sand and gravel. Interstate railroad rate restrictions and establishment of portable plants north of the Mississippi state line were the reasons the plant was closed in 1932.

Operations continued at Roseland until 1939 and then operations were established and completed in 1941 at Bluff Creek, La., about 117 miles from New Orleans. This plant is operated through a subsidiary which is the Flint Sand and Gravel Co.

The Bluff Creek plant is located in an area of abundant sand and gravel deposits. Principal equipment consists of two 12-in. hydraulic dredges, one diesel and one electric, an electrically-operated sand dredge and a loading tipple served by three rails. It is the only present inland sand and gravel operation and has a capacity in excess of 100 carloads per day of concrete sand and gravel. It is served by the 18-mile Feliciana Eastern Railroad Co., which is company-owned and is operated as a public carrier under jurisdiction of the Louisiana Public Service Commission. During World War II, a plant was in production at Crystal Springs, Miss., supplying aggregates for defense projects over a period of four or five years.

During 1949, Jahncke Service dredged, produced and transported more than 400,000 cu. yd. of shell, 200,000 cu. yd. of sand and 200,000 cu. yd. of gravel. Paul F. Jahncke, Jr., vice-president of Jahncke Service, Inc., is in charge of production and distribution of these materials.

Marine Division

Edward B. Jahncke is manager of the Marine Division which operates all floating equipment. One of the original schooners is operated under contract in the transportation of a special grade of filter sand obtainable at Horn Island off the Mississippi Gulf Coast. This filter sand is used in the filtration plant at New Orleans and has been shipped as distant as the Panama Canal Zone and as far north as Detroit, Mich.

Among the dredges now in operation are the "Captain Eddie," a diesel electric-powered 15-in. hydraulic suction unit engaged in shell dredging, and the 10-in. "Pelican" which dredges a special grade of concrete and mason sand from the East Pearl river. A fleet of 35 steel barges is now in operation. The larger dredge can load eight to ten barges of shells in ten hours.

Jahncke's fleet of tugs and barges delivers materials through various waterways contiguous to New Orleans for distances up to 300 miles. Four tugs are in this service. Modern, diesel-powered 100-ft. boom caterpillar-type cranes are now the standard equipment at unloading points. Other marine equipment includes inspection boats, steel tenders and quarterboats to house the crews when operations are in isolated localities.

Dredging Operations

The general field of dredging operations on a contract basis developed from the experience in dredging sand and gravel. The dredges "Pontchartrain" and "Tchefuncta" have tremendous capacities and have been kept engaged in very important work. The main pump of the "Pontchartrain" has a 24-in. suction and 20-in. discharge and is powered by a 1300-hp. steam turbine. One of its important accomplishments was in the building of levees to protect New Orleans from floods which involved placing 4,000,000 cu. yd. of dredged material on a contract in excess of $1,200,000.

To fulfill the contract, the "Tchefuncta" was built. It has a 22-in. suction, 20-in. discharge, and the main diesel-electric drive is rated at 1250 hp. The two dredges completed construction of the Bonnet Carre Spillway in 1931 and were then moved to other projects for the building of hydraulic levees in the Atchafalaya swamps, hydraulic highway embankments, flood control projects, dredging intercoastal canals and maintenance dredging of existing channels and harbors.

The majority of the work has been under contract for the U. S. Army Engineers in the New Orleans, Mobile and Galveston districts and has included projects along the coast from Florida to Texas. During World War II, dredging was done for the U. S. Maritime Commission at many locations. Since 1930, the Dredging Division has completed projects totalling about $23,000,000. Joseph H. Moss is manager of the Division.

Administration

Following the death of Fritz Jahncke in 1911, Ernest Lee Jahncke became president, a post he held for 18 years. Paul F. Jahncke served as vice-president and Walter F. Jahncke as secretary-treasurer. Ernest Lee Jahncke resigned in 1929 to accept appointment as Assistant Secretary of the Navy under President Herbert Hoover. He is now living in retirement at Pass Christian, Miss.

Paul F. Jahncke was elected president in 1929, Walter F. Jahncke became vice-president and treasurer, and George J. Becker, secretary. Reorganization followed the death of Walter Jahncke in 1947. Paul F. Jahncke continued as president and managing director; Paul F. Jahncke, Jr., was elected a vice-president; Herbert G. Jahncke became a vice-president; and George J. Becker was elected secretary-treasurer. W. Grant Jahncke is assistant treasurer and Fred W. Hellbach is assistant secretary. This is the official set-up today.

President Paul F. Jahncke was born in 1880 and was graduated as an engineer from Tulane University, where he was a member of Sigma Alpha Epsilon and Theta Nu Epsilon fraternities and played end on the football team. Following five years of business experience he joined his father's organization in 1905. He is a member of the Navy League of the United States, New Orleans Country Club, Boston Club, Chamber of Commerce of New York State, Newcomen Society of North America and has been a member of many other organizations and has served in many civic capacities.

Paul F. Jahncke, Jr., vice-president, attended public schools in New Orleans, New Orleans Academy, Gulf Coast Military Academy, The Hill School in Pennsylvania, Amherst College and Tulane University. His experience other than with Jahncke Service, Inc., has been in the sand and gravel and steel industries and with Woodward Wight and Co., New Orleans.

He is vice-president, Jahncke Service, Inc.; president, Flint Sand and Gravel Co.; and president of the Feliciana Eastern Railroad Co. Club affiliations are the Boston Club, Pickwick Club, New Orleans Club and Stratford Club, all of New Orleans. Paul has a son and two daughters and has been with the company for 24 years.

Herbert G. Jahncke, vice-president, is prominent in the sand and gravel

and the ready-mixed concrete industries through his active participation in association affairs and presently is treasurer of the National Ready Mixed Concrete Association. Herbert attended New Orleans Academy and is a graduate of the class of 1930 from Washington and Lee University with the degree of Bachelor of Science. He was elected to Alpha Sigma, Beta Gamma Sigma and Phi Beta Kappa honorary fraternities and is a member of Pi Kappa Alpha social fraternity. He was valedictorian of his class. He also attended the Graduate School of Law at Harvard University and then entered the Jahncke organization in 1931. With the exception of a period in 1944-1945 when he served as a lieutenant (j.g.) in the United States Navy Supply Corps, he has served continuously with the company. He is vice-president of Jahncke Service, Inc., Flint Sand and Gravel Co. and the Feliciana Eastern Railroad Co.

Herbert is a director and president of the Construction Industry Association of New Orleans (1950-51) and a director and secretary-treasurer of the Southern Builders Supply Association. Among other associations and clubs of which he is a member and/or officer are the Grand Consistory of Louisiana, New Orleans Chamber of Commerce, Young Men's Business Club, Lumbermen's Club of New Orleans, International House of New Orleans, Stratford Club, Boston Club, New Orleans Athletic Club, Parkway Commission of New Orleans, Louisiana Lodge No. 102, F. & A.M. and various carnival organizations. Herbert has three sons.

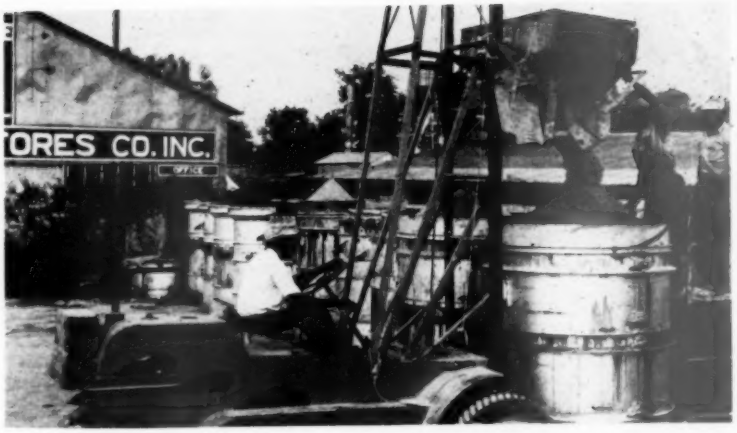
Secretary-treasurer **George J. Becker** is also secretary of Flint Sand and Gravel Co. and Feliciana Eastern Railroad Co. Mr. Becker has had varied business experience and his association with Jahncke dates back to 1917. He is a graduate in law from LaSalle Extension University, is a member of the New Orleans Association of Commerce and the Controllers Institute of America. Mr. Becker has six children.

Employe Benefits

Jahncke Service is proud of the fact that a high percentage of its personnel has a long service record. A number of the older employes are enjoying retirement under pension and 39 of the officers and personnel are members of Jahncke's 25-year Service Pin Roster. A profit-sharing plan was set up on July 1, 1950, under which 48 key members of the organization each received a check representing a share of the profits of the company.

Distributing Plant

RIVERSIDE CEMENT CO., San Francisco, Calif., has leased 100,000 sq. ft. of land from the San Diego Harbor Department, San Diego, Calif., on which it plans to build a $70,000 sacking plant and distribution center. When completed, the unit will ship bulk cement in railroad cars.



Top: Pouring ready-mixed concrete into large pipe mold. Power equipment handles pipe in the yard

Center: Jahncke maintains a fleet of about 100 trucks

Bottom: Interior view of large capacity concrete pipe plant

Regulations for Allocation of Maintenance, Repair and Operating Supplies

THE NATIONAL Production Authority issued under date of February 27, 1951, Regulation 4 and Direction 1, establishing a uniform procedure by which any business enterprise may use a government priority rating, "DO-97."

What This Regulation Does

"This regulation provides a uniform procedure by which any business enterprise, government agency, or public or private institution may use a DO rating (identified by the symbol DO-97) to obtain limited quantities of maintenance, repair and operating supplies (MRO) as well as minor capital additions. The regulation does not limit the quantity of MRO or capital additions that a person may obtain without using this DO rating, except that, if he makes any use of the rating in any particular calendar quarter, his total acquisition of MRO (rated and unrated) for such quarter becomes subject to the limitations of the regulation.

Definitions

MRO is defined as maintenance, repair and operating supplies but does not include minor capital additions. "Maintenance" includes any materials needed for the minimum upkeep necessary to keep any plant, facility or equipment in sound working condition. "Repairs" include any materials necessary to restore any plant, facility or equipment to sound working condition when it has become unsafe or unfit for service by wear and tear, damage, failure of parts, or the like. "Operating supplies" means, in the case of a business enterprise, any materials which are normally carried as operating supplies according to established accounting practice, and also includes items (such as hand tools) purchased by an employer for sale to his employes for use only in his business and under circumstances where they would constitute operating supplies according to established accounting practice if issued to his employes without charge.

"Minor capital additions" means any improvement or addition carried as capital according to established accounting practice where the total cost of materials used does not exceed $750 for any one complete capital addition. No capital addition may be subdivided for the purpose of bringing it within the foregoing definitions. Where the capital addition requires construction, authorization to construct must be obtained wherever so required by an applicable order of the N.P.A.

DO Rating Assigned

The DO rating is equal to other military DO ratings, and the supplier can "extend" it to get his materials. In using the DO rating, the symbol "DO-97" together with the words "certified under N.P.A. Regulation 4" must be placed on the order for MRO or minor capital additions, or on a separate piece of paper attached to the order clearly identifying it.

Quarterly MRO Quotas

Every person making use of the DO-97 must establish his quarterly MRO quotas. In figuring such quotas, he may include all expenditures for MRO in the applicable 1950 base periods, but not expenditures for minor capital additions. A person's standard quarterly MRO quota is one-fourth of the amount he spent for MRO in the calendar year 1950 (or, if he operated on a fiscal year basis, in his fiscal year ending nearest to December 31, 1950). Or, he may use the "seasonal" quotas, the amounts he spent for MRO in the corresponding seasons of 1950. An election to use either standard or seasonal quotas may not afterward be changed without prior written authorization of the N.P.A.

A person not in operation throughout the year 1950 (calendar or fiscal) shall establish and report his quarterly MRO quotas as follows:

(1) *Partial operation in 1950.* A person who was in operation during a part of the year 1950 shall compute the amount he would have spent for MRO in that year, had he continued throughout the year at the same rate of expenditure for MRO as during that part of the year when he was in operation, making such reasonable corrections as necessary to compensate for seasonal or other exceptional characteristics of the period of actual operation, so that the yearly amount so computed will be fairly representative of the year as a whole. His standard quarterly MRO quota shall be one-fourth of the amount so computed. Or, if he elects to use seasonal quarterly quotas, he may apportion the amount in accordance with the seasonal demands of his business.

(2) *No operation in 1950.* If a person was not in operation any or part of 1950 (calendar or fiscal), his quarterly MRO quota (standard or seasonal) shall be the minimum amount of MRO which he determines to be reasonably necessary for his operation, but not in excess of $5000 per quarter. If such quota is insufficient, an application for an increased quota may be made.

Any person who establishes a quarterly MRO quota in excess of $1000 under the provisions in (1) and (2) must, within 30 days after his first use of a DO-97 rating, notify the N.P.A. in writing of the quota he has established, the base period he used, the method by which he has figured the quota, and any corrections he has made for seasonal or other factors.

Quantity Restrictions

Every person who, during any calendar quarter, makes use of the DO-97 rating, shall charge against his MRO quota for that quarter:

(1) All MRO material ordered for delivery during the quarter, whether or not obtained by use of the DO-97, and

(2) All material for minor capital additions ordered for delivery during the quarter, if (but only if) obtained by use of the DO-97 rating.

No person may use the DO-97 rating to get anything except material needed for MRO or minor capital additions. It cannot be used for the improvement of any plant, facility or equipment by replacing material which is in sound working condition with material of a new or different kind, quality or design. Nor may a person, during any calendar quarter, make any use of the rating so assigned, order for delivery during such a quarter a quantity of material chargeable against his quarterly MRO quota which exceeds the amount of such quota (nor during the first month of such quarter, a quantity of such material exceeding 40 percent of that quarterly quota). However, there is one exception; the above quantity restrictions shall not apply in any calendar quarter to any person whose aggregate charges against his MRO quota for that quarter do not exceed $1000.

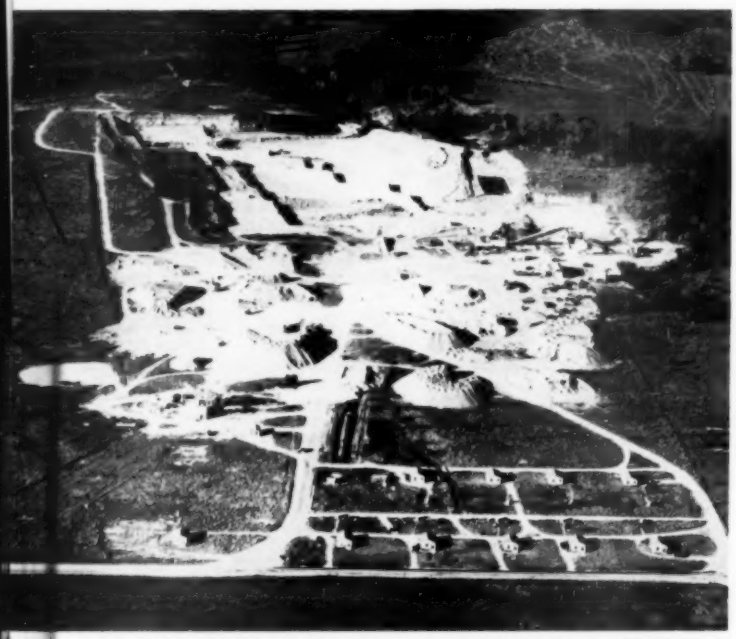
Summary

To summarize the foregoing regulations—the symbol "DO-97" must be used in placing orders for maintenance, repair and operating supplies but not for capital equipment, except that N.P.A. permits use of the rating for minor capital additions not exceeding $750 for any one complete capital addition. If more than $1000 worth of MRO per calendar quarter is used, the expense should be recorded as a charge against the MRO quota; if less than $1000 of MRO per quarter is used, only a record of the transaction need be kept.

MRO items may be obtained only in the same dollar amount spent for such items in 1950. MRO quotas are figured on a quarterly basis, which is done by dividing the amount spent for MRO in 1950 by four. Seasonal businesses may take as their quarterly MRO quotas, the amount spent for MRO in the corresponding calendar quarter of 1950.

Businesses operating only a part of 1950 may determine their quotas in

(Continued on page 158)



Air view of quarry and plant of Anchor Stone and Materials Co., near Tulsa

MERCHANDISING WITH A PUNCH

Radio and sound slides put the story of agstone over for Oklahoma producer

By HUBERT C. PERSONS*

TELL ROBERT J. PLEASANT of Tulsa, Okla., that you're not feeling up to par and it's a two to one bet that he'll tell you you're not getting enough calcium, phosphorus and other minerals in your food. He is a plump, graying man as agreeable as his name, and he has made a substantial success of the Anchor Stone and Materials Co., at Tulsa, producer of limestone aggregates. But his favorite pursuit is agricultural limestone—a hobby which he is rapidly turning into a profitable business.

The value of agricultural limestone and the benefits of mineralizing soil struck Bob Pleasant some years ago when, after an illness, his physician prescribed a medicine high in calcium. The physician explained that lack of minerals in foods is a contributing cause of arthritis and many other human ailments. Grains and vegetables grown on soil deficient in lime, the doctor pointed out, lack the protein-building elements essential to the health of men and animals. Mr. Pleasant knew, of course, that the material he had been handling all his life was calcareous rock, but never before had he realized that calcium had medicinal value.

In the early nineteen forties when the federal government began giving free agricultural limestone to farmers, Pleasant discovered that he already had on hand in his quarry large quantities of limestone too fine to be sold as concrete aggregate, but which could easily be converted into agricultural limestone. He installed a Gilson hammermill with a capacity of 100 t.p.h., and began to convert materials which he had formerly regarded as waste into first class agricultural limestone.

Until 1945, Pleasant's business in agstone had been negligible, but he sensed a growing demand and cast about for a means of cultivating the large potential market which he felt sure existed. His first advertising venture was to use spot announcements six times a week over radio station KVOO in Tulsa, appealing to farmers to enrich their soil with agricultural limestone. The response to this effort was encouraging, but Mr. Pleasant determined to do more and sought the advice of Sam B. Schneider, farm director of KVOO.

In 1946, with the cooperation of Mr. Schneider, Mr. Pleasant began a weekly 15-minute radio program telling in detail the advantages of using agricultural limestone to supply essential minerals to the soil and through the soil to vegetables, grains and meats consumed by people. The demand for agstone began to increase and Mr. Pleasant found that the fines which were a by-product of his quarry could no longer supply the demand. He then began to use the Gilson hammermill to convert larger sizes of limestone into agstone.

In 1947 Mr. Pleasant and Mr. Schneider began putting on a half hour radio program once a week, on Sundays, using music, and a short talk by Mr. Schneider with crop and weather reports. Then he and Mr. Schneider hit on the idea of using a tape recorder for on-the-farm interviews with farm wives, owners of prize animals or farmers who were making high crop production records. These interviews, which usually resulted in those interviewed becoming as enthusiastic about agricultural limestone as the program sponsor, were then incorporated into the weekly radio programs. These half hour programs were called, "Feed the Soil." Here is a typical opening announcement for one of the programs:

"Anchor Stone and Materials Co. of Tulsa, Okla., producer of Anchor agstone for your farm, and crushed limestone for your barnyard and for all types of construction, presents another in its Sunday series, 'Feed the Soil,' — featuring Sam Schneider's farm report, with Bill Simon at the organ and piano. Each week Anchor Stone and Materials brings you this thirty minutes as a reminder of this vital fact: you must feed and maintain your soil if it is to continue to feed you and your livestock."

As these programs got under way and brought increased business in Anchor agstone and in limestone for other purposes, Sam Schneider introduced some innovations which attracted nation-wide attention. Such notables as Louis Bromfield, author, former Secretary of Agriculture Clinton P. Anderson and Secretary Charles F. Brannan, consented to make recordings which were used on the programs.

*Industrial public relations consultant

Left: Loading stone to quarry hauling units. Right: Sam Schneider, left, KVOO farm director, and R. J. Pleasant look at the "prescription counter." After the farmer gets the results of his soil test and the county agent indicates what his soil needs, he can come to this mixer where any combination of agstone, phosphate, nitrogen and potash can be compounded quickly

Last summer, in cooperation with a special committee on education and research of the National Agricultural Limestone Association, of which he is chairman, Mr. Pleasant and Mr. Schneider began the preparation of an agstone "publicity kit." This elaborate kit, containing scores of practical suggestions for publicizing agstone, was described in some detail in the September 1950, issue of ROCK PRODUCTS. It was presented as a part of the report of Mr. Pleasant's committee at the mid-summer meeting of the N.A.L.A. in Cincinnati last July. A transcription of one of Mr. Pleasant's programs for his company was played during the meeting.

With the approval of the special committee the publicity kit was sent to 250 members of the N.A.L.A. and to all members of the National Association of Radio Farm Directors. According to latest reports, ten members of the N.A.L.A. are now using 15- to 30-minute radio programs and another ten are using spot announcements, all modeled after the suggestions made by Mr. Pleasant and Mr. Schneider.

The Oklahoma producer says that between 15 and 20 percent of his total business now is agstone. He believes that this will increase and predicts that the day will come when housewives will demand information on the kind of soil on which their vegetables are produced just as housewives now want to be assured that their milk and butter were produced under approved sanitary conditions.

"There is no question but that continuing publicity will make people in both city and country conscious of the value of mineralized land," Mr. Pleasant says. "They will want to know whether their foods were produced on mineralized soil. I firmly believe that use of agstone will help to bring back the fertility of all farm land and eventually will raise the level of health in all America. Agstone now is definitely a primary product, not a by-product."

Recently he installed a power mixing unit at the Anchor plant so that limestone for soil treatment can be carefully compounded in ton lots. All agstone leaving the Anchor plant is first subjected to a chemical analysis and a screen analysis as recommended by the Agricultural Conservation Programs branch of the United States Department of Agriculture.

New Gypsum Plant

A CONTRACT for the construction of a gypsum plant to be situated at Humbermouth, Newfoundland, has recently been awarded by the Department of Economic Development, St. John's, N. F., to William J. Lundrigan, Ltd., Corner Brook, N. F. Cost will be about $2,000,000.

Lehigh to Build Florida Cement Plant

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., has announced plans for the construction of a cement plant between Flagler and Bunnell, Fla., about 70 miles south of Jacksonville.

Several years ago, after considerable exploration, the Lehigh company discovered an extensive deposit of coquina near Flagler Beach. The coquina shells, which are rich in calcium carbonate, will, when mixed with low silica clays, be the raw materials for portland cement. The shells are massed in three parallel ridges, each six miles long, from 800 to 1000 ft. wide and approximately 50 ft. deep. The property, comprising 10,000 acres, abuts the Florida Intracoastal Canal throughout its length. The company also owns more than 1800 acres of limestone and clay properties near

Main crushing plant; stockpiles are in rear, with agstone pile at left foreground

Ocala, Fla., and 1000 acres of kaolin deposits in Georgia.

The plant will be built on a site directly adjoining the Intracoastal Waterway. A spur track of the Florida East Coast Railway will be extended from Bunnell, thus permitting either water or rail transportation. The company has also purchased a 5½-acre dock site along the St. Johns river in Jacksonville. Here it is planned to erect storage silos and a packhouse.

The Bunnell plant, with a capacity of 1,400,000 bbl. of cement per year, will provide cement for the national defense program and will also help to relieve the cement shortage of that area. The plant will be built by Walsh Construction Co., Davenport, Iowa, and Duval Engineering & Contracting Co., Jacksonville, Fla. F. L. Smidth & Co., New York, N. Y., is the engineer for the project. Equipment and material orders have been placed and construction will be pushed as rapidly as possible. The plant is expected to be in operation by mid-1952. Lehigh, which has been in business for over 50 years, has 13 plants located in 10 states.

NEEDS FOR LIME—ANIMAL AND VEGETABLE

By FIRMAN E. BEAR*

ON TUESDAY, AUGUST 16, 1949, *The New York Times* published an item about Edmund Sumter Ruffin, oldest member of the Norfolk bar, who had died at the age of 88. One of the important facts about this man, which *The Times* saw fit to record, was that he was the grandson of Edmund Ruffin, a "pioneer agronomist" of Virginia. This Edmund Ruffin, the grandfather, was the author of a very famous book entitled "An Essay on Calcareous Manures," the first edition of which appeared in 1832. That was 119 years ago.

This book is remarkable in that its author presented an astonishingly clear picture of the need for lime in restoring the productivity of the exhausted soils of Virginia. He had surveyed the English and French literature on the subject. He had carried on elaborate experiments of his own, and had reported on them. To him, more than to any other man in this country, may be given the credit for first setting down the fundamental principles involved in liming land and in arousing early and widespread interest in the practice.

The names of four other soil scientists, all of whom were prominent members of state agricultural experiment station staffs, merit special mention in this connection. These were Homer J. Wheeler of Rhode Island, William Frear of Pennsylvania, Charles E. Thorne of Ohio, and Cyril G. Hopkins of Illinois. To these men, all of us owe a great debt of gratitude for having carried out the careful field studies on which our present liming practices are so largely based. These men stimulated thought and action toward getting lime applied to the land, as the first step in maintaining it at a high level of productivity for the kinds of crops we need more of for animal and human consumption.

Liming the land is now a firmly established practice in all the progressive countries of the earth. In 1949, 26,000,000 tons of liming materials were applied to the farmed lands of the United States. Of that quantity, 25,000,000 tons was limestone. These figures show that a great many farmers in this country believe in the use of lime and that more than 95 percent of these men prefer to use limestone.

Liming Regions

The agricultural limestone industry is mostly confined to that part of the United States where the annual rainfall is in excess of 30 in. This includes virtually all of the land east of the Mississippi River, one full tier of states west of the Mississippi, and a high-rainfall area along the Pacific Coast, including northern California, Oregon, and Washington.

In this eastern half of the United States, rainfall increases from west to east and from north to south. In proportion as more rain falls, larger amounts of the soil's natural supply of lime are dissolved, carried down the rivers, and dumped into the sea. This leaching process has been going on for many millions of years with the result that large areas of land have lost virtually all their carbonate of lime and have become strongly acid.

Tremendous tonnages of rock- and soil-derived lime have been laid down on the ocean floor. Fortunately many ancient seas are now dry land and many such lime deposits, which have been consolidated into rock, are now available for use. Once the overburden has been removed, deep beds of limestone, which vary from almost pure calcium carbonate, or calcite, to equimolecular quantities of calcium and magnesium carbonates, or dolomite, are exposed to view.

Liming Requirements

Fifty years ago, there was no very dependable method for determining when lime was needed and how much should be applied. Now we know that two factors are involved, one of which is an "intensity factor" and the other a "capacity factor." The first is measured by a pH meter and the second by a method that takes into consideration the clay and organic-matter content of the soil. When both these measurements have been made, we are in a position to make dependable recommendations about liming the land. Five hundred pounds of limestone may be enough to raise the pH value of the plow depth of a sandy soil from 5 to 6. For a loam, 2 or 3 tons may be required. For a peat or muck soil, 10 tons may be needed.

Dr. Firman E. Bear

Fifty years ago, much of the limestone used on the farm was prepared for use by burning in homemade kilns or by crushing in portable mills. Now the job has been taken over by large limestone producers who prepare the material in accordance with definite specifications as to purity and fineness. Much of the agricultural limestone is now a first-class product. To the west, the tendency is to favor the coarser grades of limestone, whereas the finely pulverized products are favored in the east. The important point for the farmer to realize is that if he wants quick results the limestone must expose a lot of surface to the solvent action of the soil. That requires fine pulverization. This is especially important for the dolomitic types of limestone.

Fifty years ago, farmers hauled their liming materials home from the nearest available source of supply, transferred it by hand to a spreader, and distributed it by horse power over their fields. It took a lot of time and a lot of hard work to get the job done. Today many farmers merely reach for the telephone, call their limestone producer, and soon thereafter the limestone is being spread over their fields by truck without any physical effort on their part. In proportion as this type of service has been made available to farmers, larger tonnages of liming materials have been applied to the land in this country.

Liming the land has been reduced to a fairly exact science. The soil on many farms is being tested from time to time and limestone is being applied in accordance with the results of these tests, taking into consideration the needs of the crops that are to be grown. So many soil tests are now being made yearly that state and private testing laboratories are finding it difficult to meet the demand for such service. Limestone, fertilizer, and canning companies test soils. So also do some farmer cooperatives. Many of the larger farmers have individual test kits. Some of them have their own soil-testing laboratories.

Good Liming Practice

There are many differences of opinion among those who have to do with recommendations as to what consti-

*Chairman, Soils Department, Agricultural Experiment Station, Rutgers University, New Brunswick, N. J. This paper was presented at the Agricultural Limestone Institute convention in Cincinnati, Ohio, February 7-9

tutes good liming practice. Soil scientists from Ohio, New York, Pennsylvania, New Jersey and Maryland have just completed the material for a joint bulletin entitled "One Hundred Questions and Answers on Liming the Soil." It took four years for these men to reach an accord on the answers to these questions, and much compromising had to be done.

There are still a lot of things we don't know about liming the land. Among the many points at issue in the five-state discussions was that of the pH value at which it is desirable to maintain the soil in humid regions for the best results with most crops. It was finally agreed that, except for such acid-soil crops as potatoes and blueberries, the aim should generally be to maintain the pH value of the plow depth of soil between 6.0 and 6.5. This decision is based on the knowledge that if the pH values are pushed above 6.5 the solubilities of some of the essential minor elements, notably manganese, zinc, cobalt, and copper, may be so reduced that a lack of one or more of them may become a limiting factor in crop or livestock production. This is especially true with the sandier types of soil, such as are found on the coastal plains along the Atlantic Ocean and the Gulf of Mexico. But such minor-element deficiencies are not confined to sandy soils.

The availability of some nutrient elements, including one of the minor-element group, increases with rise in pH values. The minor element referred to is molybdenum. This element is known to be essential for nitrogen fixation by the nodule bacteria of legumes and for reduction of nitrates in protein production in non-legumes. There is considerable evidence that a very important reason for liming the soil is to increase the availability of the molybdenum in it. In some cases, it is conceivable that as little as 1 lb. sodium molybdate could take the place of 1 of the 2 tons of limestone that are often applied to each acre in the liming program.

Limestone's Role

The primary purpose of liming acid soils is to replace the acid hydrogen with alkaline calcium and magnesium. But the soil's exchange complex must also contain potassium. There are very good reasons for maintaining these four elements in fairly definite ratios in the exchange complex. In New Jersey, we have come to the conclusion that the hydrogen, calcium, magnesium, and potassium should be kept as nearly as feasible at ratios of 20, 65, 10, and 5, respectively. This is in terms of equivalents, rather than as percentages of the elements. On an equivalent basis, 1 part H will replace 20 parts Ca, 12 parts Mg, or 39 parts K.

Three important points are involved in suggesting that these four elements be maintained in about these ratios in the soils of humid regions. Any very marked departure from them may lead to a deficiency of some needed element in the plant. It may result in nutritional disturbances to the consumer of the plant, whether animal or man. It may increase the cost of growing the crop.

The hydrogen values of soils are important in relation to the availability of most of the minor elements. The potassium values determine, to a very large degree, how much calcium and magnesium the crop will be able to obtain from the soil. Given the opportunity, the plant will take up three or four times as much potassium as it requires for optimum growth, at the expense of its calcium and magnesium. The equivalent sum of calcium, magnesium, and potassium in a given species of plant, under uniform environmental conditions, tends to be a constant. But the amount of any one of these elements may vary within very wide limits without affecting yield. An abnormally high content of potassium is objectionable not only from the point of view of the consumer, but also because it makes crop production unduly expensive.

Potassium has value to animals and man, but an excess should be avoided. One of the serious diseases of cattle in the regions where winter wheat is pastured is grass tetany. The potassium content of this pastured wheat has been known to be as high as 5 percent of its dry weight. As a result, the amount of calcium and magnesium in the crop is greatly reduced. The imbalance between potassium and calcium interferes with the normal rhythm of the heart. Grass tetany is relieved by an injection of calcium gluconate. The same remedy is applied to overcome milk fever in cows, and probably for the same reason. In some cases, excessive soil potassium causes the magnesium content of the feed to be too low. This affects muscular activity and calls for the supplemental use of magnesium either by way of the feed or by injection into the blood-stream.

In proportion as more potassium is taken up by plant roots than the plant requires for optimum yields, the cost of production of the crop is greatly increased. Let us assume that limestone costs $6 a ton applied to the land and that the 60-percent grade of muriate of potash sells at $60 a ton. On this basis it costs nearly 16 times as much to supply an equivalent of potassium as it does one of calcium. This means that, for greatest economy in production, the soil and plant should be fed as much calcium as possible, up to the point where yields begin to fall off because of deficiency of some other element.

Even though the equivalent ratio of calcium to potassium in the exchange complex of the "ideal soil" is set at 13:1, a corn plant growing on that soil will contain only ½ to ½ as many equivalents of calcium as of potassium. In other words, plants have such a marked capacity to extract potassium from the soil's exchange complex that it is difficult to prevent waste of this element. The answer to this problem lies not only in keeping the soil well limed but in applying potassium in relatively small annual doses rather than in large infrequent doses.

Within limits, the absorption of unneeded potassium does not harm the plant. But the value of the plant for animal or human consumption is impaired. The amount of calcium in the human body is about 3.75 percent of the dry weight. This is nearly 20 times the percentage of this element in the dry matter of the corn plant. In contrast, the potassium percentages of the corn plant and of man, on the dry-weight basis, tend to be almost identical. From this it is apparent that whereas potassium tends to concentrate in plants, animals have greater need for calcium. From 5 to 10 lb. of ground limestone is being added to every ton of open-formula dairy-cow feed produced by the G.L.F. farmers cooperative, and from 20 to 40 lb. to every ton of poultry feed.

Calcium Needs

It is highly important that the calcium needs of animals and man be met. The most effective means of meeting them is by applying lime to the soil. This permits much of it being used twice, first by the plant and then by the animal. Lime should be applied liberally and regularly. If the crops we are growing permit it, we should not only maintain the plow depth of soil at a pH value between 6.0 and 6.5 but a considerable depth of subsoil as well. This latter is best accomplished by plowing lime under.

The starting point in correcting the acidity of a strongly acid soil is to apply the lime to the plowed soil and work it in thoroughly. Once the acid conditions in the plow depth of soil have been corrected, then it becomes logical to apply lime for maintenance purposes to the sod crop in the rotation and plow it under. By this procedure we finally arrive at a deep, well-limed soil capable of producing high acre yields of the most important grain, grass, legume, and vegetable crops.

Lime often effects marked improvement in the physical properties of soils in humid regions. This is largely an indirect effect in that it is a result of the larger and more extended root systems of the crops that grow on well-limed soils. Greater amounts of the above-ground parts of plants are also available for incorporation into the soil. One result of these increases in quantity and depth of organic matter is a much improved granulation of the soil. Another is an increase in the number and activity of earth-

(Continued on page 159)

Overall view of the Missouri Valley processing plant

PROVING TO FARMERS THAT LIMING PAYS

Radio farm adviser engaged by Missouri agstone producer to organize and correlate sales effort

WHAT CONSTITUTES A merchandising program for agricultural limestone? Many say: "This material can not be merchandised—there is too narrow a margin of profit"; or "Without government subsidy, agstone will never move." And yet officers of Missouri Valley Limestone Co., Inc., Des Moines, Iowa, annually spend a great deal of time, effort and money to acquaint farmers in a three-state area with the merits of its agstone.

In "Fertilime," the registered trade name for this company's agricultural limestone, is seen part of the key to a successful merchandising program. Before anything can be profitably advertised, it must have an individual name that is both easily remembered and which promotes the product. "Agricultural limestone" is an unwieldly phrase, and agstone or aglime is too commonly used in the sense of a generality. "Fertilime" is not only easy to remember, spell and pronounce, but it also promotes limestone in the accepted category of fertilizer. This guarantees its product to contain at least 80 percent calcium carbonate and also guarantees that 80 percent will pass a No. 8 sieve.

This company uses all the usual media of advertising, including newspaper, radio, premiums and sponsorship of local athletic events. All these media are utilized to the fullest extent. All dramatically express not only the imagination that goes into this company's merchandising program, but also the untiring effort such an all-out presentation entails.

Merrill Langfitt, KMA's farm service director, second from left, records information given by C. M. Kirtley, Missouri Valley Limestone Co., on the use of limestone for increasing land production. Glen Stout, quarry foreman, and Herman Snater, production manager and research director, await their turn

Radio Advertising

Use of radio advertising by this firm goes considerably further than mere spot announcements or sponsorship of a local program, but it has evolved from that stage in the past four years. And now the radio station's farm service manager is a full time employe of the limestone company. A farm news program is presented by the service manager each week-day morning at 6:45 o'clock. But his efforts on behalf of "Fertilime" do not cease after "Fertilime News Time." He attends all agricultural meetings of importance anywhere in southwest Iowa, northwest Missouri and east central Nebraska. He reports the highlights of these meetings over the air, giving the farmers of this section a timely, on-the-spot report of all happenings having a bearing on their interests.

This man is known intimately to almost every farmer in the area. The company recently sent him on a trip with 100 local farmers to sections of northwestern United States and Canada to see for themselves what farmers of other areas were doing to increase the efficiency of farming.

Scraper removing the overburden on the limestone deposits, at the company quarry, Macedonia, Iowa

Another step in the use of radio beyond simple advertising is found in a company-sponsored, radio-announced essay contest among children of the county schools. Any child up to the 8th grade is entitled to submit an essay titled "Fertile Soil and its Reward to the Farmer." Each week a winner is chosen and the pupil's school is awarded a large American flag. In the company's scrapbook is a letter from a local county superintendent of schools commending the company for the project. Part of the letter says: "Your topic ties in closely with the soil conservation units in our regular school work, and I am sure that the weekly contests have provided additional interest in many counties."

Printed Advertising

Newspaper and magazine advertising, to bring results, must be used imaginatively—not merely the filling of space with company name and product manufactured. A tie-in is made by this company between radio and newspaper through the weekly publication of an ad containing a picture of the current winner of the "Salute Your Neighbor" program. Each week some member of the radio's listening audience is selected for the "salute" for outstanding help to the local farming community.

Another most important form of advertising which is often overlooked by agstone merchandisers is that of editorial mention in local farm papers. An example of such promotion, tied in with this company's "Fertilime" advertising, appeared in a recent issue of *Wallace's Farmer* and *Iowa Homestead*. The article was titled "Limestone is Important in Iowa," and pointed out not only agstone's aid to the farmer in promoting good stands of legumes and boosting crop yields, but also that the salaries paid to the estimated 3000 spreader-truck drivers in Iowa made an important contribution to local business. This article was illustrated with five large photos of the local operation that followed in sequence from the drilling of blast holes to the spreading of lime on a typical Iowa farm.

Missouri Valley Limestone Co. produces more than "Fertilime." Below the company name on its letterhead are the words: "Fifteen limestone and gravel deposits in southwest Iowa." The first "Fertilime" operation was started in 1945, 1½ miles west of Macedonia. The second, opened in 1949, is approximately 28 miles south and east of the first, and in 1950 the third, about 50 miles south and east of Macedonia, was opened.

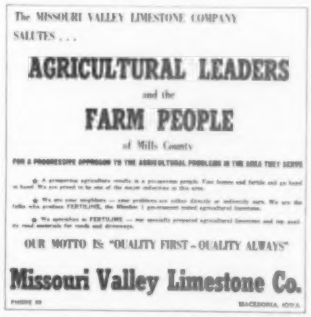
Added to the emphasis placed on radio by this company are many of the basic forms of agstone merchandising, including direct mail pieces with an enclosed reply-order card. The brochures distributed by state and national agstone associations look better for the imprint "Fertilime" in addition to the company name. And as a last mention of the company's utilization of every possible avenue of approach to merchandising can be mentioned the modern letterhead imprinted on all company stationery. The importance of a well-designed, simple, yet striking letterhead can not be over-emphasized in this day of aggressive, merchandising-minded competition.

Officers of the corporation are Herman E. Snater, president; Arling E. Smith, vice-president; and C. M. Kirtley, secretary-treasurer. Merrill Langfitt, in addition to radio work, spends a good share of his time in conducting promotion and public relations work.

Perlite Stucco

GREAT LAKES CARBON CORP., New York, N. Y., recently announced that lightweight Permalite (perlite) aggregate has received Los Angeles approval for use in exterior stucco. The general approval was granted for the use of exterior plaster consisting of a scratch and brown coat of plastic portland cement and perlite aggregate mixed in the ratio of one part of plastic portland cement to four parts of perlite aggregate by volume and a finish coat of plastic portland cement and sand mixed in the ratio of one part cement to 4½ parts of sand by volume.

Left to right are Herman Snater, Merrill Langfitt and L. Van Ness, radio station KMA, standing in the quarry


The MISSOURI VALLEY LIMESTONE COMPANY
SALUTES . . .

AGRICULTURAL LEADERS
and the
FARM PEOPLE
of Mills County

FOR A PROGRESSIVE APPROACH TO THE AGRICULTURAL PROBLEMS IN THE AREA THEY SERVE

OUR MOTTO IS: "QUALITY FIRST – QUALITY ALWAYS"

Missouri Valley Limestone Co.

PHONE 60 MACEDONIA, IOWA

A typical example of the ads published weekly by the company

The company is now conducting experiments in its various laboratories and in actual field tests throughout the country to determine whether perlite aggregate can be used successfully in exterior stucco in other areas of the United States, particularly those that have a wide range in temperature from season to season.

Physical and Chemical Characteristics of Limestones and Dolomites

By NATHAN C. ROCKWOOD

IT IS OFTEN REPEATED that no two limestones in Nature are ever exactly alike. Of course, that is one factor which makes them so interesting to the curious, and most producers of limestone are more or less curious about the nature of the deposit or deposits they work. Two recent Bulletins are helpful in satisfying such curiosity. One is "Acid Etching in the Study of Limestones and Dolomites," by J. E. Lamar, Circular No. 156 of the State Geological Survey of Illinois, Urbana, Ill.

Dr. Lamar explains how etching tests are made and says: "Information from etched specimens, particularly that relating to the nature and distribution of non-carbonate materials, has important practical significance in connection with studies of abrasiveness, structural soundness, and weather resistance." A large part of the booklet is composed of photographs and photomicrographs of etched limestone surfaces, and a mere glance at these will readily convince anyone of the vast differences in limestones. We would think this method of examination should be of much value to aggregate producers, in determining, for example, how uniform their product actually is. The illustrations are all of typical Illinois limestones.

The captions under the half-tone illustrations give partial explanations of what is shown in the etched sections. For example under Fig. 3B the comment is: "A clastic limestone, as evidenced by the presence of rounded quartz sand grains and masses of silica; it is relatively impure. It is not likely to be highly weather resistant." Another example under Fig. 4B, "A clastic limestone; moderately pure. The clay partings may adversely affect the weather resistance of the stone." Of course, these are the opinions of an expert, but we feel certain that any limestone producer with the help of a microscope or magnifying glass, and a little expert advice, could find out a great deal about his particular material. If he found some extra good points, with the help of his photographs or photomicrographs, he could probably develop some excellent sales arguments.

Trace Elements in Limestones

"Detailed Survey of the Chemical Composition of Rock Layers in an Agricultural Limestone Quarry" is the title of an interesting bulletin reprinted from *Economic Geology*, August 1950. The authors are W. D. Keller, Arnold W. Kleme and E. E. Pickett of the University of Missouri, Columbia, Mo. The quarry was a small dolomite operation in Jefferson county, and is more or less an example of what may be the chemical analysis of any midwest limestone.

We have often argued in the columns of ROCK PRODUCTS that the agricultural limestone producer who did not have a really complete chemical analysis of his products might be missing a bet in sales promotion. After reading a new textbook on agricultural chemistry, we are more than ever convinced of this, for when we speak of "trace elements," we mean just that. These occur in the most fertile soils in but a few parts per million, but they may make the difference between a healthy plant with maximum food value and one of perhaps little food or vitamin value.

This booklet explains in detail the field examination in which ten separate and distinct rock layers were sampled. These ranged in calcium carbonate equivalent from 95.80 to 67.55, with insolubles 7.96 to 38.77 percent, which alone is adequate proof of the variability of a quarry face only 30 ft. high. The accompanying table gives the results of spectrographic analyses in percentages of each element. Now 0.0004 percent may not seem very much, but it is 4 parts per million, and that in trace elements is often plenty.

The authors' conclusions are:

"Considerable variation in acid insoluble impurities, and consequent Ca and Mg content, occurs between different beds of rock. Information on the mineral and chemical composition of available rock should prove helpful in selecting agricultural limestone quarry sites. Lithologic appearance can commonly be correlated with chemical composition.

"Agricultural limestone should be classified on a basis of Ca, Mg, and trace element content rather than on its acid neutralizing, $CaCO_3$ equivalent.

"The content of trace elements is variable between beds. Mn, Cu, B, Sr, Ba, and Cr are common, and Ni, V, Ag, Ga, Pb, and Zn are less common or less abundant.

"The most efficient development and utilization of agricultural stone calls for close cooperation between pedologists who discover their soil needs; and geologists who discover what the rocks and minerals can supply."

LAYER OR SPECIMEN	Mn	Cu	Co	Zn	B	Ni	V	Mo	Cr	Ag	Sr	Ba	Ti	Sn	Pb
A	5^{-3} 0.1	3^{-5} .0008			2^{-3} .04	3^{-4} .006			.01 0.2	5^{-5} .001	.2 4.	.03 0.8	.1 2.		
B	2^{-3} .04	5^{-5} .001		5^{-3} 0.1	3^{-3} .06	3^{-4} .06	2^{-3} .04		.01 0.2	5^{-5} .001	.3 6.	.03 0.6	.3 6.		
C	5^{-3} 0.1	1^{-4} .002		2^{-3} .04	1^{-3} .02				5^{-3} .01	5^{-5} .001	.1 2.	.02 0.4	.2 4.		
D	.02 0.4	2^{-4} .004		3^{-3} .06	5^{-3} 0.1		5^{-3} 0.1		.02 .4	2^{-5} .0004	.2 4.	.2 4.	.3 6.		
E	.03 .6	5^{-4} .01			3^{-2} .06	3^{-4} .006	5^{-3} 0.1		.03 6	2^{-5} .0004	.05 1	.03 0.6	.2 4.		2^{-4} .004
F	3^{-3} .06	5^{-4} .01		.02 0.4	5^{-3} 0.1	5^{-4} .01	3^{-3} .06		.03 6	2^{-5} .0004	.02 0.4	.03 0.6	1.0 20.		
G	.01 0.2	5^{-4} .01		1^{-3} .02	2^{-3} .04	2^{-4} .004			.02 .4	2^{-5} .0004	.02 0.4	.03 0.6	.2 4.		2^{-3} .04
H	.01 0.2	3^{-4} .006		1^{-3} .02	1^{-3} .02	2^{-4} .004	1^{-3} .02		.02 .4	5^{-5} .001	.03 0.6	.02 0.4	.2 4.		
I	3^{-3} .06	5^{-4} .01			2^{-3} .04	2^{-4} .004		2^{-3} 0.4	5^{-3} .01		.05 1.	.03 0.6	.1 2.		1^{-4} .002
J	.02 .4	1^{-3} .02			3^{-3} .06	5^{-4} .01	1^{-3} .02	3^{-3} .06	.01 0.2	2^{-5} .0004	.3 6.	.2 4.	.1 2.	2^{-4} .004	3^{-4} .006
BIN	1^{-3} .02	2^{-4} .004			1^{-4} .002	1^{-4} .002			.02 .4	2^{-5} .0004	.05 1.	.03 0.6	.2 4.		2^{-4} .004
CHATS AND ROAD ROCK	3^{-3} .06	1^{-3} .02		1^{-3} .02	1^{-3} .02	5^{-4} .01	1^{-3} .02		.01 .02		.2 4.	.2 4.	.2 4.		
Gr. qy.	.02 0.4	2^{-4} .004							2^{-3} .04		.1 2.	.02 0.4	.01 0.2		

AMOUNT OF EACH ELEMENT REPORTED IN PERCENT PRESENT, UPPER FIGURE, AND IN POUNDS OF ELEMENT PER TON OF LIMESTONE, LOWER FIGURE. THE FIGURES LIKE 5^{-3} ARE ABBREVIATIONS OF 5×10^{-3}. LOOKED FOR, BUT NOT DETECTED IN ALL ABOVE SAMPLES: Cd, Li, Bi, As, Sb, Be, Ga.

Spreading and Handling Wet or Dry Agstone

Innovations in spreader and truck design developed by New Zealand producers enable year-around spreading

By H. J. TOPP*

Top: Demonstration of the use of blowers for spreading dry agstone. Center: Test made in New Zealand of the effectiveness of reducing dust by spreading agstone while wet. The truck at right is spreading dry material, whereas the truck at left is using wet material. Spreading rates are the same—1 ton per acre. Bottom: No attempt is made to protect stockpiles of agstone from weathering

NOTABLE ADVANCES are being made in the problem of bulk handling of agricultural limestone for soil enrichment by agstone producers, equipment manufacturers and by farmers themselves in New Zealand. Bulk handling, efficiently developed, has many advantages over the comparatively slow and costly method of handling bagged materials, New Zealanders have discovered. It begins with the transport of the agricultural limestone from its place of manufacture and ends with the spreading of the product on the field of the farmer.

One of the ways in which this has been done is by the contract system whereby the farmer orders his agstone not in bags to be carted to his shed and spread when he has time, but rather at so many hundredweight to the acre spread on his fields, ordered without even seeing it until it is coming out of the spreading unit of his contractor's machine.

Problems presented in bulk handling of liming materials have to do with transference of the material from one vehicle to another, or with its storage while awaiting delivery. It is significant that from the farmers' point of view, all of the advantages of bulk handling are of direct benefit to them, while all of the problems are for the contractor to solve. This situation seems to be reversed when the material is bagged and handled in the usual manner.

A development of bulk handling the New Zealanders are working on is the use of separate machines for spreading on the fields and for hauling on the road, for they have had the experience that a vehicle well-designed for road transport is often not too satisfactory for off-highway work. With the use of more than one vehicle, a means of transferring the load from one to another is necessary.

The problem of storage of bulk liming materials is not a simple one in many cases, especially where the material is first hauled by rail, but the New Zealand producers have discovered that agstone, contrary to a popular belief, can be stored in the open without being harmed by rain. The only complication in this is that the spreading machines must be able to spread the wet limestone — a thing many will not do.

*Manager, The Farmers' Mauriceville Lime Co., Ltd., Wairarapa, New Zealand

Wet Agstone Spreader

It is said that millions of tons of limestone are spread wet in England every year. Wet agstone has an advantage over dry limestone in that it is cleaner to handle and it is said to cause less wear on working parts of the spreading machine. In one place in New Zealand limestone is transported by rail from a plant to a point 60 miles distant and unloaded at the rail point into stockpiles from whence it can be hauled by truck to the fields of the individual farmers. The machine used in unloading the rail cars was designed by H. J. Topp, manager of the agricultural limestone plant of The Farmers' Mauriceville Lime Co. The wet agstone spreaders are said to be different from those made anywhere else, having no hopper with sloping sides in which the wet material might pack down with vibration, but having, instead, the load lying on a flexible mat that covers the entire deck of the truck. As the truck moves forward the mat is rolled on to a spindle at the rear so that the whole load on top of it is drawn back. As it passes over the back edge of the truck it is "milled" into twin chutes by a revolving mill with lawn mower-like blades. Below each chute is a spinning spreader driven by a small motor, so that the speed of the spinners is independent of the forward speed of the truck. The rate of spread per acre is determined by the depth of the material loaded into the truck.

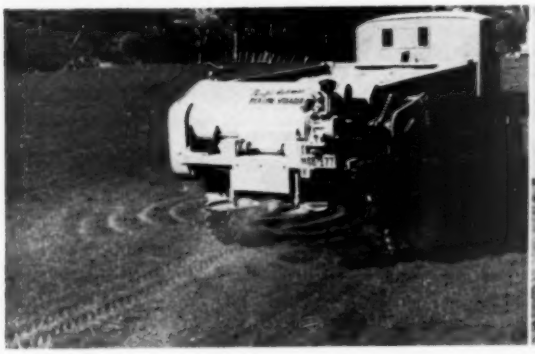
To insure that agstone is available when it is wanted, substantial stockpiles have been established in many farming districts of New Zealand served by rail lines. This is encouraged by the railroad as a means of relieving pressure on the line at busy seasons. A great pile of limestone alongside a rail siding near Feilding contains up to 15,000 tons. Previously, limestone production in that country was limited to the spring and summer months. There was usually limited storage space at the plants and but a few farmers could find weatherproof storage for more than a limited amount. So what was once a seasonal demand is now a year-round business, with the material being stockpiled during the winter months, either at strategic railroad siding or on the farm.

Until recently all limestone produced in New Zealand had been dry material. The process of drying had, itself, added to the costs of production, but there was no equipment available for handling anything but the dry product.

Blowing Machines

About two years ago the first fertilizer blower appeared in Australia, and hundreds of them are said to be now in use there. The fact that so many farmers have been eager to try out the blowing machines seemed to indicate an urgent need for a reasonably inexpensive machine to spread liming materials on steep hillsides.

Just how well a blower is likely to work on any particular job will vary with different circumstances, since it is obvious that the machine has both advantages and weaknesses. The supreme advantage of the blower is that it is the only machine which a farmer may own and operate himself and put fertilizer on hills too steep for



Spreader truck in operation. The material is thrown from the rotating discs in even waves. A belt the width of the truck feeds the discs

Spreader truck being loaded with material which is very wet from exposure. Rotating discs are driven by separate engine, on right rear of truck

wheeled vehicles. Another advantage is that it is cheap to run and maintain.

The manner in which the spreading job is likely to be accomplished will probably vary according to the conditions of the locality, but it is almost certain to improve as the farmer or operator acquires more experience on his own particular slopes and ridges and the way air and wind currents act on them. The most definite thing that can be said about the blowing machines in New Zealand is that many experienced and reliable farmers who have used them for more than one season are quite satisfied with the spread they are getting, according to a recent account of wind-spreaders in *The New Zealand Farmer.*

One thing which may be assumed from actual experience is that the effectiveness of blowers varies considerably with different materials, being the lowest with coarsely-ground substances, and increasing with the fineness of the particles. With agstone, it is probably important to use a consistently finely-ground product. Where fairly coarse material is used there is a danger that it may be spread thickly quite close to the blower and not thick enough at the top of a nearby hill.

One finding which appears to be common to all satisfied New Zealand users of blowers is that for the best results the operator must move his machine about a great deal. This is not usually difficult, for the machines are not very heavy and one may easily be mounted on a small sledge and drawn by a horse or horses. It is important that air currents and wind direction be known if best results are to be obtained from the blower, but there is nothing more effective than the blower itself to ascertain this information. The most effective currents seem to move uphill rather than downhill, although many slopes have been fertilized by blowing the lime from the top to the bottom. Some blowing units are truck-mounted. A New Zealand manufacturer of a bulk spreader for wet or dry lime is Pacific Engineering Ltd., Wellington, whose product is known as the Pacific-Automat spreader. Another machine is the Estcourt Blower Topdresser made by A. F. Martin Ltd., Palmerston, North, N. Z.

Stockpiling Advantages

While agstone can be spread the year around in some types of terrain, and in some types of climate, this practice is by no means universal. Where agstone can be produced throughout the year but cannot be spread, stockpiles are the answer to efficient production. Overhead is then spread over a large tonnage, staff is held together and the manufacturer's general routine is not interrupted. This added efficiency can more than offset the cost of mechanical double handling plus the cost of interest on the capital charges involved in producing the material for the stockpile together with freight charges, where applicable.

Weatherproofing stockpiles in the usual way must raise the price of agstone, so either a better method of weatherproofing the material must be found or a spreader has to be evolved which will spread agstone evenly in any condition, wet, dry, puggy or friable.

Unable to develop a cheap weatherproofing of stockpiles, The Farmers' Mauriceville Lime Co., Ltd., Mauriceville, N. Z., concentrated on the development of a spreader which would spread wet limestone evenly. They considered the solution to the problem to be one of conditioning the wet agstone to a state for spreading with centrifugal force, with the grains grated or scraped from the bulk which settles with the travel of the spreader truck.

In this firm's first experiment, it laid chain netting on the floor of a spreader truck. When this was loaded and wound up by a 9-in. roller at the rear of the truck, powered by pall and ratchet gearing, the limestone was grated off and fell through the meshes on two chutes to two spinners.

This model illustrated that wet agstone could be sown, so the firm secured a site alongside a rail line 60 miles away which would provide storage for some 15,000 tons, and began stockpiling operations. An interesting fact is that the firm's dry agstone weighs 108 lb. per cu. ft., and its wet agstone weighs 84 lb. per cu. ft. The dampness also prevents leakage out of cracks in rail cars or trucks and the dust nuisance is eliminated. The separation of fine and coarse particles is done away with in spinner spreading, since in wet agstone fine particles adhere to the larger ones and an even spread is possible. In prolonged dry spells the agstone dries out to a friable sand, but it is never as dusty as dry agstone.

Size Specifications

The government specification for agricultural limestone in New Zealand is 50 percent passing 30 mesh. It prefers all through 10 mesh and 50 percent through 60 mesh, and this renders the agstone pasty when saturated with water. But with the grating action of the spreaders, even limestone in this condition can be spread evenly.

The problem of separating minus 10-mesh damp, although friable material, appears to be a difficult one because of its tendency to blind the screen cloth with near size or sticky fines. The answer may be to do away with screen cloth altogether, or in some manner to pass small particles through large holes. The latter is possible in gravity screens where the slope of the screen determines the product through a given hole, but because the fall cannot be faster than the set speed, the relationship between the size hole and the size product cannot be as great as it would if faster speeds were attained.

Machine developed for unloading small rail cars carrying limestone. A door in the side of the rail car is lowered and the machine boom lowered into the car

Details of the car reclaiming machine. A revolving worm the length of the car brings material to the center, where it is scraped by the angles onto a belt conveyor underneath

Faster speeds, however, may be obtained with centrifugal force and separators may be constructed with large openings moving at high speed, passing small particles, or conversely, material can be made to move fast over stationary openings, as happens when screening through pulverizer bars. A separator has been made which has a saucer-shaped rotor with a vertical shaft with smooth radiating "spokes" or bars radiating from a central disc. In action the curved radiating bars are rotated at a speed which passes through only the size required and the oversize is flung off the periphery by centrifugal force which also flings the aggregate when it is fed onto the central disc or plate.

Another form of this is seen in a cone-shaped screen with large openings in relation to the through product. The cone has to be smooth inside and fed from its small end when the shaft is in a horizontal position. It is then rotated at high speed so that the material skids on the surface of the screen. A baffle may be necessary in some cases to prevent centrifugal force taking the material around. So long as the speed of material or screening device, or combination of both are attainable, fine, non-clog screening is possible with damp materials.

In connection with the idea of doing away with screen cloth, the obvious answer is to winnow the fine material from the coarse. It is necessary to have a thin stream of material to achieve the desired results. There may be difficulty with some materials in obtaining this high speed to insure capacity. Where this situation exists, capacity can be obtained by making a vertical cylindrical curtain or shower, the fines of which are deflected by a circular jet of air from within or without. This arrangement has the advantage of being easily fed, easily separated and easily collected. It is also easily manufactured, as all moving parts may be concentric. The blast of air required is surprisingly low in pressure and in volume.

H. J. Topp, manager of The Farmers' Mauriceville Lime Co., Ltd., sums up the developments as follows:

"We are investigating the possibilities of producing agstone with a double impeller breaker and a rod mill either in dry, damp, or wet condition, similar to sand production. Now that we know that we can spread agstone in any condition, new horizons are in view. It looks as though the farmer will benefit by obtaining limestone when and where he wants it at a slightly better price."

Buys Gravel Company

WILLIAM C. RIDENOUR, Fredericktown, Ohio, has purchased the Wayne Gravel Co., located one mile southwest of Fredericktown. The plant is to be merged with The Ridenour Brothers Lime Spreading Service and will operate under the name of Wayne Gravel & Lime Co.

To Install Kiln

CAROLINA GIANT CEMENT CO., Philadelphia, Penn., is expanding facilities at its Harleyville, S. C., plant by the addition of a new F. L. Smidth rotary kiln. The kiln, 11 ft. 3 in. dia. x 425 ft. long, will produce an estimated 3000 bbl. of clinker daily. J. A. Philbrick is president of the company.

A.S.T.M. Committee C-7 on Lime

RESEARCH WORK IN Committee C-7 on Lime of the American Society for Testing Materials has been concentrated on the development of a laboratory slaker for slaking lime. At the meeting held recently in Cincinnati, Ohio, it was reported this is well along, with a final report expected at the June meeting of the Society in Atlantic City.

A special task group has been appointed to study the Standard Specification for Sand for Use in Plaster (C 35), which is under the joint jurisdiction of Committee C-7 and Committee C-12 on Masonry Mortars. This review is to develop any necessary changes due to the increased uses of such lightweight aggregates as perlite and vermiculite. Initially it is expected that Committee C-12 on Mortars for Unit Masonry will give this matter first consideration.

The committee went on record approving the new tentative specification for masonry mortar proposed by Committee C-12, with however certain comments, which will be presented to Committee C-12 for further consideration. A progress report was presented covering round-robin test on settling rates on lime and on iron determination, with more work being needed before a final report is submitted.

Paper for Gypsum Board

NATIONAL GYPSUM CO., Buffalo, N. Y., is planning construction of a $4,000,000 paper mill near Pryor, Okla. Although the site of the mill has not yet been selected, company officials stated that negotiations were under way for a 40-acre tract near Pryor, owned by the Grand River Dam Authority. Construction is expected to be completed by the end of 1951. The mill will provide employment for about 250 people and its paper production will supply the company's board plants at Fort Dodge, Iowa; Rotan, Texas, and Medicine Lodge, Kan.

A project to increase the capacity of the company's Fort Dodge, Iowa, plant by about 25 percent is nearing completion. Plant additions include a rock storage silo and another calcining kettle. Also, the length of the board plant is being extended by about 100 ft. All work is expected to be completed before mid-year, 1951. Melvin Baker, company president, expressed hope that the expanded capacity of this plant would greatly relieve the pressure on the gypsum market in the Chicago and North Central regions.

Sand and Gravel Producers Hold Successful Annual Convention

Meeting in New Orleans stressed effects and interpretations of government controls, cost-saving ideas for production, specifications and safety

A NEW RECORD OF 1280 registrants was established for a non-exhibit year, at the thirty-fifth annual meeting of the National Sand and Gravel Association and the twenty-first annual convention of the National Ready Mixed Concrete Association held in New Orleans, La., February 12-15. The excellent attendance reflected the continued prosperity of both industries, their growing acceptance of the informal, discussional-type of meeting, the desire for up-to-the-minute interpretation of wartime emergency restrictions and the choice of the convention city. New Orleans is a winter resort city and the conventions were blessed with ideal weather conditions. There were 475 ladies in attendance, an all-time high, and they enjoyed a delightful program of entertainment. Following the conventions, a great number of producers and wives took off for Florida points, to Central and South America and to other winter vacation areas.

According to established custom, the two associations are definitely committed to holding their 1952 conventions at the Stevens hotel, Chicago, Ill., in connection with the biennial machinery exposition. According to plans made prior to the New Orleans conventions, the two industries were scheduled to meet during one week, and the National Crushed Stone Association and its Agricultural Limestone Institute during a second week, the two weeks to be consecutive because of the machinery exposition and in accordance with the arrangement for previous exposition years.

One of the difficulties has been that the consecutive weeks available at the Stevens hotel, which is the only hotel in the United States with facilities that can accommodate the combined conventions and exposition, do not usually come at a suitable time. Tentatively, the last week in February and the first week in March had been scheduled for the 1952 conventions according to committment. Opposition developed to the lateness of the dates, in discussions at New Orleans, because operating men ordinarily should be busy at that time in preparing their plants for the coming production season.

Accordingly, plans for the 1952 meetings, as to dates at the Stevens, were to be reconsidered and the Manufacturers Division has voted to cooperate in the plans as finally concluded by the associations. Plans for future expositions were thoroughly considered. Both the associations and the Manufacturers Division appointed committees to consider the practicability, starting with 1954, of holding machinery expositions outside the convention hotel. Cleveland, Ohio, with its large public auditorium, will be considered seriously. Decisions as to the timing of the conventions, and findings of the committees appointed to investigate the feasibility of an outside exposition in 1954 will be reported at the Fall meetings of the N.S.G.A. and N.R.M.C.A. boards of directors. The latter meeting will be held October 1-3, 1951, at the Greenbrier, White Sulphur Springs, W. Va., instead of in Washington as originally planned. The national conventions will be held in San Francisco, Calif. in 1953 and, in 1955, at Miami, Fla. Next year's Fall meeting of the board of directors will be at Swampscott, Mass., just outside Boston.

This year's convention headquarters were at the Roosevelt hotel and the registrants, by necessity, were assigned rooms in some half-dozen of the leading hotels in New Orleans. In view of the fact that the availability of machinery and repair parts is of great concern, special headquarters were provided for informal meetings of manufacturers' representatives and producers to consider problems of equipment and supply.

Program

Meetings of the two boards of directors and a joint luncheon for both were held on February 12 preceding the opening of the conventions the following day. There were present 29 of 35 active members of the board of directors, N.S.G.A., and seven past-presidents. Only one director of the N.R.M.C.A. was absent and there were eight past-presidents present. The board of directors of the N.R.M.C.A.

William Moore, left, president of N.R.M.C.A., and Harris N. Snyder, center, president of N.S.G.A., are shown receiving certificates of honorary citizenship of New Orleans from the mayor of the city, deLesseps S. Morrison

established a C. "Dolly" Gray fellowship in honor of past-president Gray (deceased) which now makes two fellowships for research at the University of Maryland research laboratory. The other is the Stephen Stepanian fellowship. Appropriate resolutions were passed by both boards expressing appreciation to the University of Maryland for the continued very successful cooperative arrangement for conduct of research, and expressing regrets to honorary members in their absences.

It was announced before both boards, and later in the convention sessions, that Walter H. Acheson, a board member of N.R.M.C.A., was planning to go to Washington to head up price controls for both industries. Mr. Acheson, as head of the masonry division of OPS, will also be charged with the responsibility for price controls governing portland cement, crushed stone, slag and masonry materials.

The general sessions covered three full days and there were five joint meetings. In addition, there were separate sessions of special interest to each industry, which necessitated holding several simultaneous sessions.

Among special meetings were those of the executive committees and the Manufacturers Division on February 10; a luncheon for members of the Ohio Ready Mixed Concrete Association on February 12; a joint luncheon for both associations on February 13 to hear an address by The Honorable deLesseps S. Morrison, Mayor of New Orleans; and a luncheon meeting for state and district association officials.

The general sessions had an absolute minimum of outside speakers in preference to the informal type of discussions which are arranged for the maximum interchange of ideas between members.

Principal subjects covered in the general meetings of interest to both industries and in the separate sessions for sand and gravel producers included aggregate specifications, the highway program, a technical presentation on crushing, sand classification, removal of undesirable particles from gravel, taxation, cost accounting, government controls on industry, a clinic on concrete proportioning, employe relations, the testing of concrete aggregates and stream pollution. Addresses of both presidents and combined reports of the executive secretary and the director of engineering for both associations were presented at a joint session opening the convention program.

Reports of subjects of special interest to producers of ready-mixed concrete, and certain topics considered in the joint sessions, are published in the CONCRETE PRODUCTS Section of this issue, wherein the main report of the National Ready Mixed Concrete Association convention is published. This report, of the National Sand and Gravel Association meetings, also covers many topics of interest to ready-mixed concrete producers that were presented in joint meetings.

Presiding Officers

Harris N. Snyder, president of the National Sand and Gravel Association, was presiding officer for the opening joint session which heard the presidential addresses, the reports of the executive secretary and director of engineering, and a speech on the necessity of adequate highway programs. William Moore, president of the National Ready Mixed Concrete Association, presided over the luncheon at which Mayor deLesseps S. Morrison was the speaker.

E. K. Davison presided over a session which was entirely for consideration of specifications and operating problems. John W. Murphy was chairman of a joint meeting that was conducted as an open forum on taxation and cost accounting; A. R. Shiely occupied the chair for another joint session that was a forum on industrial

R. E. Weaver, Lincoln Sand & Gravel Co., Lincoln, Ill., a member of the executive committee of the National Sand and Gravel Association, discusses a problem with Stanton Walker, director of engineering, National Sand and Gravel and National Ready Mixed Concrete Associations, Washington, D. C.

controls under the defense program; and Norman J. Fredericks presided over one on employe relations. Robert Mitchell was chairman for a meeting that considered the testing of concrete aggregates and stream pollution and he awarded the safety trophies presented each year by ROCK PRODUCTS. Stanton Walker and Delmar L. Bloem conducted a clinic on the calculation of concrete proportions which was held for both associations in two separate meetings.

Officers

H. N. Snyder, The Buffalo Slag Co., Buffalo, N. Y.; Albert R. Shiely, J. L. Shiely Co., St. Paul, Minn.; and John W. Murphy, Union Sand and Gravel Co., Spokane, Wash., were re-elected president, vice-president and secretary-treasurer, respectively, of the National Sand and Gravel Association.

E. Phil Gemmer, Texas Construction Material Co., Houston, Texas, and Donald D. Reynolds, Boston Sand and Gravel Co., Cambridge, Mass., were elected as new members of the executive committee to fill vacancies resulting from the death of H. D. Bellamy and the retirement of W. Agnew Bliss. Robert H. Baker, Dixie Sand and Gravel Corp., Chattanooga, Tenn., and R. E. Weaver, The Lincoln Sand and Gravel Co., Lincoln, Ill., were re-elected to the executive committee.

The board of directors consists of the following: Robert H. Baker, Dixie Sand and Gravel Corp., Chattanooga, Tenn.; C. A. Barinowski, Montgomery Gravel Co., Birmingham, Ala.; Fred E. Bellamy, Concrete Materials and Construction Co., Cedar Rapids,

Robert Mitchell, left, congratulating D. E. Baker, Texas Construction Material Co., Houston, Texas, upon receiving a ROCK PRODUCTS safety trophy

Left to right: H. W. Wallis, Wallis Sand Co., Gainesville, Ga.; Joseph G. Riley, W. E. Balliet, both of the Blaw-Knox Co., Birmingham, Ala.; H. C. Peters, J. W. Peters & Sons, Burlington, Wis.; and R. A. Bradshaw, L. S. Bradshaw & Sons, Salisbury, N. C.

In a jovial mood are, from left to right, Hardy McGrath, Lehigh Portland Cement Co., Birmingham, Ala.; H. N. O'Neil, Lehigh Portland Cement Co., Chicago, Ill.; N. Cascotti, The Superior Concrete Co., Oreland, Penn.; and Frank L. Kelley, Colonial Sand & Stone Co., Inc., New York, N. Y.

Iowa; Charles E. Brady, B. V. Hedrick Gravel and Sand Co., Lilesville, N. C.; Edmond F. Brovelli, Basalt Rock Co., Inc., Napa, Calif.; Joseph A. Bullen, The Fountain Sand and Gravel Co., Pueblo, Colo.; Morgan R. Butler, Butler Bin Co., Waukesha, Wis. (representing Manufacturers Division); Fayette J. Cloud, W. R. Bonsal Co., Hamlet, N. C.; Otto S. Conrades, St. Louis Material and Supply Co., St. Louis, Mo.; Fred D. Coppock, American Aggregates Corp., Greenville, Ohio (honorary); Fred P. Curtis, Lyman-Richey Sand and Gravel Corp., Omaha, Neb.; E. K. Davison, J. K. Davison & Bro., Pittsburgh, Penn.; Charles S. Dickson, Standard Sand and Gravel Co., Wheeling, W. Va.; William J. Doyle, Jr., Tulsa Sand Co., Tulsa, Okla.; E. Phil Gemmer, Texas Construction Material Co., Houston, Texas; Paul C. Graham, Graham Bros. Co., El Monte, Calif.; Heyward Green, Green Brothers Gravel Co., Jackson, Miss.; Wm. Edward Hole, American Aggregates Corp., Greenville, Ohio; Ralph C. Johnson, Simplicity Engineering Co., Durand, Mich. (representing Manufacturers Division); Howard W. Jordan, Metropolitan Sand and Gravel Corp., Port Washington, N. Y.; Donald W. Kelley, Arizona Sand and Rock Co., Phoenix, Ariz.; M. G. Kerr, American Aggregates Corp., Detroit, Mich.; Wayne W. King, The W. S. Tyler Co., Baltimore, Md. (representing Manufacturers Division); Daniel J. Miller, Portland Sand and Gravel Co., Portland, Penn.; Frank R. Morrow, South Bend Sand and Gravel Corp., South Bend, Ind.; John W. Murphy, Union Sand and Gravel Co., Spokane, Wash.; Richard J. Nugent, Nugent Sand Co., Louisville, Ky.; J. P. Eyre Price, Wyoming Sand and Stone Co., Scranton, Penn.; George W. Renwick, Chicago Gravel Co., Chicago, Ill.; Donald D. Reynolds, Boston Sand and Gravel Co., Cambridge, Mass.; John W. Roberts, Southern Materials Co., Inc., Richmond, Va.; G. G. Robinson, Consolidated Sand and Gravel Ltd., Toronto, Ontario, Canada; Nathan C. Rockwood, Naperville, Ill. (honorary); Eric W. Ryberg, Utah Sand and Gravel Products Corp., Salt Lake City, Utah (honorary); Albert R. Shiely, J. L. Shiely Co., St. Paul, Minn.; Alfred H. Smith, A. H. Smith Co., Branchville, Md.; H. N. Snyder, The Buffalo Slag Co., Buffalo, N. Y.; Stephen Stepanian, The Arrow Sand and Gravel Co., Columbus, Ohio; and R. E. Weaver, The Lincoln Sand and Gravel Co., Lincoln, Ill.

Presidential Address

President Harris N. Snyder of the National Sand and Gravel Association, in his annual address before the opening joint session, first paid tribute to Paul Jahncke, Sr., Herbert Jahncke, and Paul Jahncke, Jr., of Jahncke Service, Inc., New Orleans, La., for the many years of accomplishment of the company and for their hospitality and contribution to the success of the convention.

He then commented to considerable length on the value of the association to its members and cited annual production figures to disclose the growth of the industry since the association's founding in 1911. In mentioning that production was in excess of 319,000,000 tons in 1949, of which 231,000,000 tons was classed as commercial production (Bureau of Mines figures), he said that the 88,000,000 tons produced by government and contractors stands as a challenge to the industry.

Mr. Snyder spoke of the hazards to the industry by virtue of changing specifications which can, as he illustrated in the case of his own company, throw a previously acceptable product out of the market. In his particular case, the association was called in and was responsible for adoption of a practice that eliminated the objectionable material which was the cause for rejection of the sand in question. That kind of service in the solution of a specific problem, he pointed out, is available to others with similar conditions, through the interchange of ideas made available through the industry association. Director of engineering Stanton Walker was paid high praise for his efforts with specification writing groups and for research that has enabled protection of markets and developed new outlets.

The Manufacturers Division was complimented for its cooperation and interest in the industry's problems, and the value of the trade press to the associations was acknowledged.

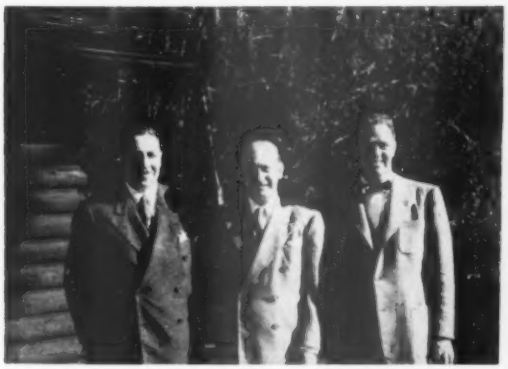
Mr. Snyder then turned to the national emergency and the problems that regulation will impose on industry and which can be interpreted for the industry only through an association representing the individual companies. He was high in his praise of executive secretary V. P. Ahearn for the thorough job he continues to do in interpreting governmental regulations according to the needs of the industry and in carrying out the many activities of his office to the advantage and progress of the industry.

State associations and regional meetings of the kind that are being held with regularity, according to Mr. Snyder, are invaluable since they permit Mr. Ahearn and Mr. Walker to have that close contact with the industry that reflects in their national activities in behalf of the industry.

While the association enjoys excellent membership and is truly representative of the industry, Mr. Snyder suggested that member companies continue to invite non-members to join. He concluded by expressing his thanks to the board of directors, the various committees and the staff for their cooperation and helpfulness during the past year.

Executive Secretary's Report

Executive secretary V. P. Ahearn, in his consolidated annual report for the two associations, presented a very encouraging report on finances and covered many topics of current interest and in considerable detail. Each of the associations has a substantial



Three Californians stop for the camera at the Jahncke estate. Left and right are Robert Mitchell and Q. W. Best, Consolidated Rock Products Co., Los Angeles. In the center is N. J. Redmond, Blue Diamond Corp., Los Angeles

Three officers in a meditative mood at the Jahncke estate are, left to right, E. K. Davison, J. K. Davison & Bro., Pittsburgh, Penn.; Donald D. Reynolds, Boston Sand & Gravel Co., Cambridge, Mass.; and John W. Roberts, Southern Materials Co., Inc., Richmond, Va.

surplus in cash and bonds and is in excellent position to continue an enlarged program of activities.

The outlook for construction was one main topic covered. Construction expenditures in 1950 totalled some $27.7 billion which was 23 percent higher than the 1949 level which was the greatest previous construction year in history, dollarwise. Physical volume reached a new peak as well in 1950, some 10 percent greater than the previous high mark in 1927 and 15 percent greater than the 1942 war peak year. Home construction accounted for the greatest volume in 1950, totalling 1,400,000 units which exceeded the 1949 record volume by 35 percent.

While the housing boom began to decline late in 1950, industrial building was 84 percent higher in December than for December, 1949, and commercial building increased 60 percent. According to figures quoted from the U. S. Department of Commerce, expenditures for new plant and equipment are planned to a record total of $21.9 billion in 1951. If manpower and materials are available, industrial and commercial building will be very heavy in 1951.

While home construction will decline about 40 percent from 1950 figures, public construction expenditures are expected to increase. Assuming sufficient availability of manpower and materials, the Department of Commerce estimates the 1951 construction volume to be about 20 percent under 1950 which would still equal the high 1949 figure. The estimated total figure is $22.5 billion but upward surges in construction costs are considered inevitable. More drastic allocation orders by NPA which would stop the flow of basic materials, Mr. Ahearn pointed out, can upset the predictions. He believes that the highway program is in for a fight in order to survive.

Aside from new required industrial construction it is apparently the belief in Washington that much of the military construction requirements are available as left over from World War II, so increased prohibitions of new construction are very likely as manpower and critical materials become tighter.

As to sand and gravel production, the official figures given for 1949 were 319,104,000 tons valued at $248,443,000, of which 231,205,478 tons was commercial production at an average price of 91 cents per ton. The production in 1950 was estimated to be some 10 percent higher and the prediction was made that commercial production would decline 20 percent in 1951.

The fact that the industry produced some three billion tons in the last 12 years was pointed to as the reason that new problems have arisen requiring concentration on the need for cultivating good public relations. The public demand for elimination of stream pollution and the difficulties encountered from industrial zoning laws and demands for land rehabilitation were cited.

Mr. Ahearn estimated that ready-mixed concrete production in 1950, which increased some 17 percent over 1949, was at least 32,000,000 cu. yd. valued at $325,000,000 and requiring 40,000,000 bbl. of cement. According to some sources the figure is 25 percent higher. The two industries together produced products valued between $650 and $700 million in 1950.

The cement shortage of 1950 was discussed by Mr. Ahearn, and the statement of principles which the board of directors of the N.R.M.C.A. adopted and submitted to chief executives of cement companies stating its position on how distribution of cement should be governed in order to give fair treatment to the ready-mixed concrete industry in times of shortages. The result was a denial by the cement industry that it had not appreciated the importance of giving the ready-mixed concrete industry its fair share of available supplies.

It is believed that the cement industry and the ready-mixed concrete industry, as a result of this interchange of opinions, have a better understanding of the problems of each other which will contribute to continued good relationships which are considered essential. According to Mr. Ahearn's estimated figures, the cement industry produced 226,055,000 bbl. in 1950, eight percent over 1949, and shipped 227,788,000 bbl., 11 percent over 1949. He considered that an excellent performance record. Some of the new cement plants under construction were mentioned, which will increase production substantially in 1951.

Transportation shortages were a difficulty in 1950 and, according to Mr. Ahearn, the railroads had 34,000 fewer cars at the end of the year than the year earlier. Of new cars on order, there are 49,000 gondola and hopper cars. No substantial relief from the railroad car shortage is expected for two years. Another complication is that manufacturers of trucks and truck parts are being faced with problems resulting from substantial allocations of steel for railroads and ore boats. This may be serious because 60 percent of commercial sand and gravel moves by truck.

The railroad's current petition before the Interstate Commerce Commission for a 6 percent rate increase has serious implications and was to be resisted. Trucks will continue to gain at the expense of the railroads for shipment of sand and gravel as borne out in the records of recent years. Under price control, there is the prospect of inability to pass on to the customer the increased cost of rail transportation which will also be brought to the attention of the I.C.C.

Manpower is expected to be ex-

Alfred H. Smith, A. H. Smith Co., Branchville, Md., right, talking over the day's events with Robert Mitchell, Consolidated Rock Products Co., Los Angeles, Calif.

Mr. and Mrs. Arthur C. Caldwell, Wyoming Sand & Stone Co., Scranton, Penn., pause for a picture in the lobby of the Roosevelt hotel

tremely critical and Mr. Ahearn anticipates that great pressure will be brought to bear on workers to transfer to defense industries. He considers it essential not to retire able workers, and urged the use of women and handicapped workers to the fullest possible extent. He then commented on the importance of safe operations from the humanitarian standpoint and he mentioned that accidents are rapidly becoming more expensive. Proposals are being brought before the various state legislatures for increasing benefits under workmen's compensation insurance laws. He urged greater participation in the industry safety competitions.

Mr. Ahearn's office has been very active in its contacts with NPA with respect to priorities and allocations of equipment. The great needs of the two industries for MRO items were touched upon as urgent but, since Mr. Ahearn's talk, Regulation 4 has been enacted by NPA to permit the industries to obtain maintenance, repair and operating supplies generally up to their needs during 1950, as reported on page 95 of this issue.

There will be intense competition for critical materials like steel, copper and aluminum even if there is no outbreak of war with Russia, said Mr. Ahearn, because of the need to supply the armed forces, equip other countries and build stockpiles of materials. Great ingenuity will be required on the part of management to keep their plants and businesses going.

While percentage depletion for the sand and gravel industry was denied due to the war situation, the industry has a good case and Mr. Ahearn will continue to seek benefits for the industry. Through the efforts of J. Rutledge Hill, chairman of the N.S.G.A. committee on taxation, the Excess Profits Tax Act of 1950 has been amended, permitting a producer with more than one operation to combine his properties in computing excess output. Mr. Ahearn is actively seeking exclusion of the industries from the wartime renegotiation act which will be enacted. Efforts to repeal the three percent transportation tax have been rejected because it produces substantial revenue to the government.

Wage and price controls are expected to create hardships because they do not allow for additions to base period prices necessitated by increased costs and, in addition, many companies may be compelled to absorb certain new taxes soon to be imposed. Inequities and ambiguities are bound to result, regardless of good faith, and Mr. Ahearn hopes that price control will be decentralized as much as possible. He said that wage controls will be softened but that price controls will be progressively tightened. Furthermore, he believes that wage and price controls may be with us for a long time.

As to labor disputes, an agency is expected to be established for the purpose during the emergency which will have the undesirable effect of killing collective bargaining at local levels. Where unions represent employes of a company, Mr. Ahearn was emphatic in advising companies to settle labor disputes if at all possible in collective bargaining.

The two associations have been very active in the field of labor relations and many reports on various phases of these activities have been mailed the membership in 1950. Presently, a report is being prepared on a proposed group insurance plan. Mr. Ahearn said that, while there has been improvement in the quality of collective bargaining agreements, there are still too many that surrender away the rights of management.

The associations have continued to hold regional meetings and plans provide for a number of such meetings in 1951. The National Sand and Gravel Association now has 187 active members and 71 associate members. The National Ready Mixed Concrete Association has 442 active members and 62 associate members. Both associations enjoy the largest memberships in their history. In conclusion, Mr. Ahearn expressed his appreciation to the officers, board members and membership for their cooperation.

Report on Engineering

Director of Engineering Stanton Walker also presented a consolidated report for both associations, covering the nature and scope of the work and discussing some of the engineering problems of the two industries. Much of the report related to subjects presented previously but was given for emphasis. Activities of an engineering nature include activities related to representation of the industry and its membership, consultation with members and customers for the development of useful information, distribution of published literature, research, and miscellaneous activities.

Much of Mr. Walker's time, as reported, has been devoted to participation in the work of committees of engineering organizations which concern the sand and gravel and ready-mixed concrete industries, and in representing the industries before political agencies. His office has been active in its program of publications and a number of publications and technical information letters were released during 1950.

The fifth annual short course of instruction for industry technicians was well attended, with about 100 registrants, and continues to be so popularly accepted that enrollment must be limited. Representatives from customer organizations were discouraged this past year and it likely will be necessary to limit enrollment from member companies for the next course.

Mr. Walker has been extremely active in participation at regional meetings and as a speaker before various technical organizations. He continues to lecture on engineering materials at the University of Maryland and, through 1950, conducted a course on concrete technology for graduate students which is scheduled to continue through 1951. At present, W. G. Mullen is the only graduate fellow in research, he being an appointee under the Stephen Stepanian Fellowship sponsored by the National Ready Mixed Concrete Association.

Research in the laboratory was cov-

ered at considerable length and Mr. Walker expressed his great satisfaction for the fine cooperation received from the University of Maryland and its staff, notably Dr. H. C. Byrd, president, and Dean S. S. Steinberg of the College of Engineering. The report concluded with a listing of the various researches underway or completed.

Highways

"The Urgency of Adequate Highway Programs" was the subject of an address at the opening joint session by Robert J. Potts, a member of the Texas Highway Commission and past-president of the National Sand and Gravel Association.

His talk stressed the inadequacy of our highway programs for the past 20 years and the greater need today than ever before for improvement of the highway system. He was critical of the fact that the importance of highway building in the past has never been recognized on its own merits with the result that other considerations, such as providing employment, influenced federal appropriations. The decision to include highways in the construction freeze during the last war was termed as foolish, in view of the fact that there was a demand for fast and dependable highway transportation of heavy loads during the war. Nothing other than access roads and a few mandatory projects were added to an essential part of our war-making potential as a result. The speaker mentioned that our loss of investment in roads was stupendous as a result.

Whereas the A.A.S.H.O., in 1948, presented testimony to Congress calling for $22 billion needed investment, based on a detailed appraisal, on the federal-aid system, the result was a reduction in the appropriation to $450,000,000 for the year. The trouble, as was pointed out, was that unemployment was not a factor, taxes were still high and fair deal "benevolences" required a lot of money.

Needs, as pointed out to Congress in 1950, total $28.9 billion, $7 billion higher than two years ago because of continued deterioration and increased unit costs. It was suggested that $2.9 billion annually was needed for the federal-aid system for each of the next 15 years. The $1.45 billion required in federal aid was pointed out as being much less than federal receipts in gasoline and excise taxes taken from road users in 1950. Because of devaluation of the dollar, it was pointed out that the appropriations in the early 1930's bought more road work than our present appropriations do, in times when the need for roads is three times as great.

Mr. Potts pointed out that vehicle miles of travel increased 60 percent to 500,000,000 miles per day from 1940 to 1950. The government policy of disregarding legal load limits for military hauling as practiced during the past war should not be permitted to be repeated.

Two prominent Texas couples taken at a stopover enroute to the Johncke estate. Left to right are Mr. and Mrs. Robert J. Potts, and Mr. and Mrs. E. Phil. Gemmer

The outlook for highways during the war emergency period was summed up in the following paragraph:

"So, it appears that the general outlines of our emergency road building pattern are rather clearly cut, namely, access jobs will be built speedily; approximately normal conditions will prevail for jobs on the National System of Interstate Highways. The deficiencies on this so-called National Defense System are estimated at $11¼ billion. These roads are, of course, a part of the Primary Federal Aid Highway System and will be eligible to absorb that entire item of the congressional appropriation. A large fraction of the urban jobs are parts of the Interstate System and apparently will move forward with that system. The big unknown is in the federal and state secondary highways. Some of these will no doubt be found highly desirable for the national defense, or civilian needs, and will be built. Others may lag badly unless emergency restrictions are subsequently lightened."

Fundamentals of Aggregates Specifications

THE FIRST SPEAKER, in a session set aside to consider production, was Stanton Walker, director of engineering, National Sand and Gravel Association and the National Ready Mixed Concrete Association. His paper was entitled the "Fundamentals of Aggregate Specifications." Mr. Walker said there were four basic groups in the classification of aggregates. The first group embraced size and sizing and related specifications. The second group covered hardness and soundness, the third, cleanliness and purity, and the fourth group related to soundness and durability.

In his paper, Mr. Walker restricted himself to requirements presenting special problems with relation to the four basic factors that influence specifications.

He mentioned that the requirement for separated sizes of coarse aggregates has become widely accepted. Whereas there has been progress toward the standardization of sizes, he believes that much must yet be done in securing universal acceptance of uniform standards.

In the matter of fine aggregates, there is even less standardization but he said that the trend toward more rigid limitations on grading and uniformity of grading continues. As a result of agencies dealing with low cement content concrete, standardization is being approached toward a minimum of about 10 percent passing the No. 50 sieve and 2 percent passing the No. 100 sieve.

Mr. Walker then touched upon fineness modulus as a measure of uniformity of grading. Whereas A.S.T.M. and A.A.S.H.O. tolerate a range of plus or minus 0.20 in F.M., the Corps of Engineers limits the range to ± 0.10. Also, some organizations are fixing a maximum and a minimum fineness modulus such as 2.40 to 2.90 which are common. A few specifications actually fix the shape of the curve representing the grading of the sand, one approach being to limit the percentages of separate sizes.

Hardness and strength of aggregates have relatively little effect on the compressive strength of concrete but show up in flexural strength which

At the Jahncke estate are, left to right: Jeanette Weaver, R. E. Weaver, Mrs. A. H. Smith, Alfred H. Smith, Betty Lawton, Mrs. R. E. Weaver, and Mrs. Helen Nordberg

is important in pavement slabs, said Mr. Walker.

As to cleanness, it was stated that there was need for performance testing or for means of identification. One approach to identifying and measuring the quantity of soft and unsound particles involves the erroneous assumption that such particles are lighter in weight than the sound material and has suggested limiting the amount of material floating on a liquid of a given specific gravity. Freezing and thawing tests, in Mr. Walker's opinion, offer the soundest approach to a solution.

Mr. Walker also commented on reactive impurities and thermal incompatibility and means for identification and interpretation. He believes that conflicting opinions point to the need for more research. As to soundness and durability, he does not believe either the sodium or magnesium sulfate tests to be sufficiently discriminating but he believes that a high loss should be regarded with suspicion in evaluating aggregates.

In conclusion, he said that if a specification were to eliminate all aggregates except those unqualifiedly known to be good, available material would be so limited as to hamper construction and that the economics of construction requires that specifications provide for use of "less than the best."

In the discussion that followed, chairman E. K. Davison asked if there was a method of identifying soft particles that would eliminate the human equation. Mr. Walker said that a test was under study whereby the piece of aggregate was scratched with a brass pencil and if the pencil grooved the rock, the aggregate was considered soft. If not grooved, the rock could be considered hard. The feeling was expressed that the test was not a satisfactory one.

Wayne W. King, W. S. Tyler Co., Baltimore, Md., called the group's attention to his company's booklet, Catalog No. 53, that was a sort of text book on the general subject here discussed and that anyone interested could secure a copy by addressing the Cleveland office of W. S. Tyler Co.

C. E. Wuerpel, Marquette Cement Manufacturing Co., Chicago, Ill., was introduced to the group. Mr. Wuerpel said there was a long way to go before all the answers regarding portland cement and concrete would be known and that at present it was practically impossible to determine the causes of concrete failures and at times to determine the reasons for lack of concrete durability. His company, he said, was accepting the challenge by doing more and more research, and building its own research laboratory for the purpose.

J. F. McCracken, American Builders Supply Co., Louisville, Ky., suggested that work be done on perlite and vermiculite concretes and a producer from New York State suggested using a low water content for this type of concrete and not to mix or screen it too much. He also pointed out that in his opinion 90 percent of the job superintendents did not know concrete and that it was up to the ready-mixed concrete operators to help educate them.

Watching a horseshoe game at the Jahncke estate are, left to right, C. W. Shirey, Joseph L. Shiely, Jr., and Richard N. Coolidge

Glenn C. Cook, American Builders Supply Co., told of his difficulties in getting the very light in weight aggregates into the truck. He also lost considerable amounts of this type of aggregate when the wind blew it off of his conveyor belt.

The discussion differentiated between these lightweight aggregates such as perlite and vermiculite, and the heavier lightweight aggregates such as expanded clays, Haydite and similar materials.

Bob Holmes, Jahncke Service, Inc., New Orleans, La., said that most of his experience had been with an expanded clay produced near Baton Rouge, La. He told of getting 3500 p.s.i. concrete with a 4-bag mix and 5500 p.s.i. concrete with a 6½-bag mix, both without cracking the cylinders. Essentially, the strengths he obtained with the expanded shale aggregate paralleled what he got with sand and gravel. The 3500 p.s.i. concrete weighed 90 lb. per cu. ft., he said.

John W. Roberts, Southern Materials Co., Richmond, Va., said he had visited the operation near Baton Rouge and was much impressed with the strengths obtained by the concrete made from that aggregate. Another operator said that in his experience it was best to add the water first, then the aggregate, and to add the cement slowly.

Murray S. Simpson, Super Concrete Corp., Washington, D. C., said vermiculite concrete was used in his area and that it needed considerable water. His practice was to add two-thirds of the aggregate to the water in the drum, revolve the drum and then add the balance.

Robert J. Hummel, Consumers Co., Chicago, Ill., said he planned to use his present cement screw and bucket elevator in handling the very lightweight aggregates and John W. Roberts thought the equipment would not work. One reason for this was that at times the aggregates are wet and sometimes dry.

H. Irving Rhine, Bode Gravel Co., San Francisco, Calif., said he sent vermiculite aggregates out to the job and sold the cement. Laborers at the job put the material in the mixer and he charged more for waiting time.

F. P. Spratlin, Jr., Ready Mixed Concrete Co., Denver, Colo., said he had worked with perlite and vermiculite but he had better luck with pumice and that he used pumice weighing 1400 lb. per cu. yd. with a 5-bag mix and got 2250-2500 p.s.i. concrete. He wet the pumice down before using and maintained a 3- to 6-in. slump. He said scoria was also satisfactory.

(Continued on page 128)

EVALUATION AND DEVELOPMENT OF KILN EFFICIENCIES

Part I. Heat losses at elevated temperatures build up accumulative losses of great magnitude

By VICTOR J. AZBE*

THE FACT THAT ROTARY lime kilns operate with a fuel ratio in the neighborhood of 3:1 rather than 5:1, and that even good vertical kilns operate at 5:1 rather than 7:1 is because the various kiln heat losses, as a matter of custom, are never placed into their proper perspective. The true magnitude of certain heat losses is not fully realized and as a result, proper attempts to overcome them are never applied.

In the case of cement clinker and in dolomitic or magnesitic sinter operations, the situation is true to even greater extent. So, we have many cement kilns requiring 1,500,000 B.t.u. per barrel. When properly evaluated, even at 1,000,000 B.t.u. they would be only good by comparison, but not in fact.

In the evaluation of individual losses, invariably the magnitude of any heat loss is expressed as a percentage of the total heat in the fuel, which usually seems to be minor. If it is expressed as a percentage in relation to the heat usefully applied toward calcination, it would be a far higher figure. It would then likely have jolted the designers, or the operating staff into more serious efforts for conservation. Realization of the true values is much to be desired since inefficient equipment is still being installed and, in most plants, executives are so accustomed to waste that no attention is being paid to it. While there may be accountants following every fraction of a dollar in costs through their books, there often is not a single informed individual whose specific responsibility is the reduction of the tremendous thermal losses involved in kiln operations which are wasting fuel and impairing general plant economy through reduced capacity.

It is not that the conventional heat balance methods of evaluation are wrong, but that they do not disclose the facts. For operations with low temperature levels such as in the case of boilers, where steam is made at 400 deg. F., they are fairly satisfactory, but even then they start to fall short. They do fail to tell the story in lime operations where the basic working level is 1500 deg. F. and they are less accurate in cement and sinter dolomite operations where the operating temperature is still higher.

*Azbe Corp., St. Louis, Mo.

In the first part of this series of articles we will deal mostly with lime and we will use as a specific and glaring example of inefficiency a rotary kiln consuming 10,000,000 B.t.u. per ton of which there are still many in operation. Some plants require 9,000,000 and even 8,000,000 B.t.u., but that is still not good performance and the reasoning and methods of evaluation applied here to the 10,000,000 B.t.u. kiln would apply to them as well. Our analysis would apply also to the even less efficient cement kilns, which we will cover more completely in one of the later parts of this series of articles.

As an example, we propose to demonstrate that while radiation heat loss of an ordinary rotary lime kiln using about 10,000,000 B.t.u. per ton may be only 14 percent of the heat in the coal, that this is likely to be over 40 percent of the heat in the lime. Beyond that, due to the building up of losses, the figure may readily come to 70 percent of the heat in the lime. We mean that, due to radiation, there is a loss of 70 percent in production and not just 14 percent.

This article is part I of a series by the author on new theories in the evaluation and development of kiln efficiencies. Emphasis in articles to follow will be on the rotary kiln particularly. Kilns for the production of lime, cement clinker and sinter will be considered in separate articles.

—The Editors

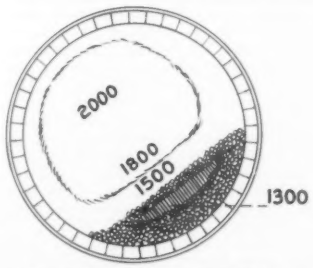


Fig. 1: Heat distribution in rotary kiln

It will be pointed out later that, by certain attempts to reduce radiation loss, which may not even involve insulation, the equivalent of much of this heat can be saved and lime output per unit of fuel increased by 50 percent.

The 50 percent is not all of the improvement possible. In this saving, we include only the improvement accomplished due to reduction of radiation loss which does not include all possible reduction of radiation loss. It does include reduction of certain other losses in part which follow when the radiation loss is reduced, since any high temperature level heat loss has a companion portion of low temperature level stack loss.

This fact is not simple to understand. It is recognized only by those who have the curiosity and the desire to study kiln heat loss problems and their involved interrelationships.

Cooler, radiation, excess air and incomplete combustion losses all are far greater than is generally assumed, particularly since the newly proposed factor of "calcination zone terminal temperature differential" plays such a great role. In the case of radiation loss, the problem would be about as follows:

Increasing capacity by any means tends to reduce radiation loss. Reducing radiation loss saves heat which is immediately available to make more lime. This in turn permits feeding in more stone and cools the escaping gases to a lower temperature. The heat of preheating of the CaO portion of the stone abstracted in the preheating zone from the escaping gases is returned by the cooler to burn still more lime, which in turn permits feeding in still more stone. This repetition continues in diminishing degree until a point of balance is reached, at which the saving may be as great as all of the initial radiation loss, even though only a part of the initial radiation loss was saved, of which none was through insulation.

Unless the problem is completely understood and all the factors controlled, it is also possible that through the means of a saving at one point there may be an increased loss at an-

other. A preheater may be installed at the end of the kiln but there is only limited benefit derived from the preheater without an effective cooler. It will reduce terminal temperature differential but, in so doing, it will increase radiation loss up to the preheater. Or a cooler may be installed and the kiln be so operated that the proportionate radiation and excess air losses become greater with little overall benefit derived. To avoid this means establishing complete mastery over the "conservation of heat of high elevation," since initially it is due to the loss of high level heat that lime is not made. Then, if high level heat is conserved and applied to the process, a portion of the low level heat becomes utilizable.

Heat of High Elevation

We must realize that heat is available to us in various temperature levels and that only that temperature above the respective reaction temperature is of determining value to the process. What good is there in the heat if only a small portion of it will calcine lime? In the case of the cement kiln, what good is heat that would make lime but will not burn clinker? When we lose heat by radiation, we lose it from the uppermost temperature level. Loss by radiation from the piping connecting a kiln to a mill may not seem to be losing heat of high elevation, but in effect it is, since heat of high elevation will later be required to bring the air back to elevated temperature.

Conservation of heat of high elevation, whether directly apparent or not is of utmost importance since such loss is a compound loss. For example, the direct loss by radiation is accompanied by a certain related and additional portion at the stack.

We could subdivide the heat stream into several different potential capacities such as:

1. Heat of very low level which is not very effective for preheating but which is valuable in the drying of stone or more so in the case of slurry and sludge.

2. Normal heat of preheating of stone above the water evaporation level.

3. Heat of dissociation of clay, and above that, of $MgCO_3$ which is 1000 deg. F. and higher.

4. Heat of calcination of $CaCO_3$—the lime-making range—of 1500 deg. F. and higher and still higher for the superheating of lime for structural consolidation or hard burning.

5. Superheating of the cement kiln mix to the point where the silica, alumina and iron begin to combine actively with the lime, which is a matter more of maintenance of kiln temperature above the bed rather than heat transfer to the bed as the reactions, being strongly exothermic, are generative of heat in themselves.

6. Calcination and subsequent heating of relatively pure dolomite and magnesite to a near perfect state of crystalline consolidation and stabilization. This is a reaction more difficult than the clinkering of cement, due to the slight evolution of exothermic heat.

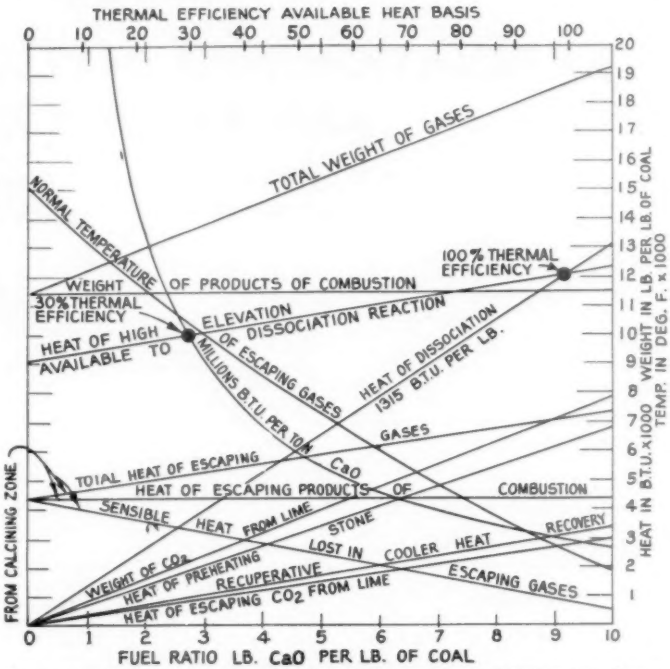

THERMAL EFFICIENCY AVAILABLE HEAT BASIS
0 10 20 30 40 50 60 70 80 90 100
TOTAL WEIGHT OF GASES
NORMAL TEMPERATURE
WEIGHT OF PRODUCTS OF COMBUSTION
100% THERMAL EFFICIENCY
30% THERMAL EFFICIENCY
ELEVATION OF DISSOCIATION REACTION
HEAT OF HIGH AVAILABLE TO
MILLIONS B.T.U. PER TON OF ESCAPING GASES
HEAT OF DISSOCIATION 1315 B.T.U. PER LB.
GASES
TOTAL HEAT OF ESCAPING
CaO
HEAT OF ESCAPING PRODUCTS OF COMBUSTION
SENSIBLE
HEAT FROM LIME
STONE
RECOVERY
LOST IN COOLER
HEAT
WEIGHT OF CO2
HEAT OF PREHEATING
RECUPERATIVE
ESCAPING GASES
HEAT OF ESCAPING CO2 FROM LIME
FROM CALCINING ZONE
0 1 2 3 4 5 6 7 8 9 10
FUEL RATIO LB. CaO PER LB. OF COAL
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
HEAT IN B.T.U. x 1000 WEIGHT IN LB. PER LB. OF COAL
TEMP. IN DEG. F. x 1000

Fig. 2: Lime kiln efficiency and corresponding weight, temperature and heat content of gases for coal

If the different zones of a kiln could be maintained without overlapping, that would be highly desirable. Then only such heat would be used for preheating as would have no value to calcine. That is a situation which is to a fair degree approached in vertical kilns, but unfortunately not in rotary kilns wherein there are great overlaps in zones which create terminal losses of heat at the end of each zone.

If the heat so lost could be utilized in the next zone it would not be serious, but in the case of lime kilns that is never so. It becomes a complete waste. Only in the case of wet process cement kilns is there some utilization of such heat, partially due to the water and partially because of the high amount of argillaceous material along with the carbonaceous portion. This requires a large amount of heat for preheating in relation to the endothermic heat of reaction which is a much greater amount than in the case of lime and sinter kilns.

In high calcium lime kilns, the junction temperature between where the stone is still stone and the lime is just beginning to be made is dependent on the CO_2 concentration and will be just about 1500 deg. F. However, it is only in a perfect kiln that this junction between the two zones can be considered as sharply defined. In ordinary kilns the stone, in its passage through the kiln, preheats gradually but never uniformly. The outside portions of any one piece will increase in temperature faster than the inner portions. Also, all pieces of stone are not equally exposed to the heat, so all do not increase in temperature equally. In rotary kilns, as shown here in section (Fig. 1), the crosshatched portion at any point through the kiln will be at far lower temperature than the lead sections directly exposed to the heat. The difference can possibly be many hundred degrees.

With respect to the gases as well, part of the stream is hotter than other parts and even the gas closest to the stone is above the 1500 deg. F. surface calcination temperature of the stone. If this were not so, heat transfer could not occur.

For our purpose in evaluating kiln performance, we will assume the junction of preheating and calcining zones to be at 1500 deg. F. but, in ordinary kilns, while the 1500 deg. F. incipient calcination temperature will still apply, the gases at that point will escape into the preheating zone at a higher temperature and most of

the stone will enter the calcining zone at a lower temperature, both of which are sources of considerable heat loss. However, since rotary kilns can, by special installations, be equipped for improved exposure of material surface and mixing, as well as for increased effective areas and greater time of exposure, all of which lead to more uniform calcination and improved heat transfer, we are justified in accepting 1500 deg. F. as the junction temperature or terminal temperature of the calcining preheating zone. Any heat escaping to the preheating zone above this temperature is considered as a high level heat loss which is termed "loss due to calcining zone terminal temperature differential."

Conditions at 100 Percent Efficiency

It may be said that a rotary kiln produces lime in proportion to the high level heat available, and that more lime is not made is because of the losses resulting from terminal temperature differential, radiation, nonrecuperative cooling, excess air and heat undeveloped through CO, H_2 and CH_4 escape. So, we gradually develop a "lime balance," which is a term to distinguish it from the conventional "heat balance," for which the basis is the graphically presented data in Fig. 2. This shows the relationship of weight, temperature and heat content of gases of kilns fired with coal of the following composition, and resultant products of combustion.

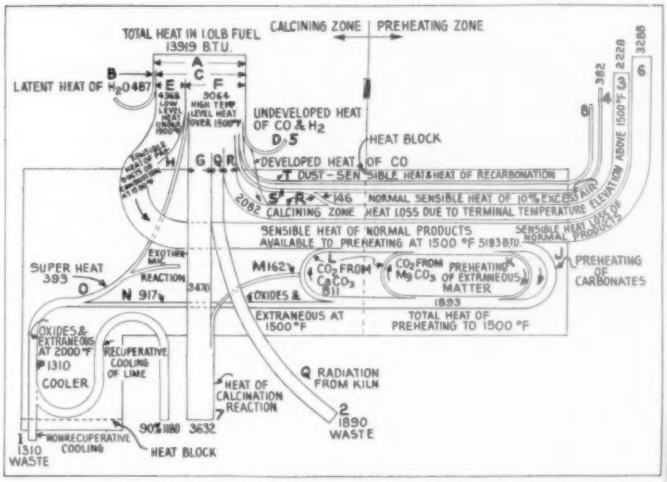

TOTAL HEAT IN 1 LB FUEL 13919 B.T.U.
CALCINING ZONE
PREHEATING ZONE
LATENT HEAT OF H_2O 487
UNDEVELOPED HEAT OF CO & H_2
HEAT BLOCK
DEVELOPED HEAT OF CO
DUST - SENSIBLE HEAT & HEAT OF RECARBONATION
NORMAL SENSIBLE HEAT OF 10% EXCESS AIR
HEAT LOSS DUE TO TERMINAL TEMPERATURE
CALCINING ZONE
SENSIBLE HEAT OF NORMAL PRODUCTS AVAILABLE TO PREHEATING AT 1500 °F 5183 BTU
SENSIBLE HEAT LOSS OF NORMAL PRODUCTS ELEVATION ABOVE 1500°F
SUPER HEAT 393
EXOTHERMIC REACTION
OXIDES & EXTRANEOUS AT 1500 °F
CO_2 FROM $CaCO_3$
CO_2 FROM $MgCO_3$ OF EXTRANEOUS MATTER
1893
TOTAL HEAT OF PREHEATING TO 1500 °F
PREHEATING OF CARBONATES
OXIDES & EXTRANEOUS AT 2000 °F
1310
COOLER
RECUPERATIVE COOLING OF LIME
HEAT OF CALCINATION REACTION
RADIATION FROM KILN
1890
WASTE
90% 1180 3632
NONRECUPERATIVE COOLING
HEAT BLOCK
1310
WASTE

Fig. 3: Heat distribution in a rotary kiln operating at 10,000,000 B.t.u./ton; high calcium lime, 95 percent CaO product. Stack temperature 1550 deg. F. Symbols explained on page 116

cination begins at 1500 deg. F. and that the gases leave the calcining zone at 1500 deg. F. There is no calcining zone terminal differential which, in actual kilns, is responsible for a very high loss. It will be further noted that heat requirements per ton of CaO at the 100 percent efficiency point are very slightly less than 3,000,000 B.t.u.

High-grade bituminous coal as received

Analysis	Percent	Products of combustion CO_2	H_2O	SO_2	Lb./Lb. of fuel N_2	Air Required
H_2O	3.24		.0324			
Ash	7.00					
C	74.10	2.85			6.91	8.98
H_2 avail.	4.25		.3795		1.124	1.38
H_2 nonavail.	.58		.0523			
O_2	4.65					
S_2	.95			.0189	.0312	.0407
N	1.23				.012	
	100.00	2.85	.4642	.0189	8.0772	10.41

Total products of combustion, 11.24 lb. High heat value per lb. 13919 B.t.u.
Low heat value, 13432 B.t.u.

In Fig. 2 there is indicated a target at 9.2—lime to fuel ratio. This is located at the junction where the 1500 deg. F. heat of dissociation of 1315 B.t.u. per pound of CaO crosses the line representing the heat of high elevation available to dissociation reaction. It is the 100 percent thermal efficiency point.

This point varies with the fuel, its composition, moisture and hydrogen content. It is also dependent on the composition of the stone, with the chart being calculated for 100 percent CaO. Any reduction in this percentage would tend to increase the possible ratio of lime to fuel.

It will be noted that even at 100 percent efficiency, the temperature of the gases escaping from the kiln is 270 deg. F. That is because there is not enough stone to cool the gases. All this is based on the assumption that calcination begins at 1500 deg. F. and that the gases leave the calcining zone at 1500 deg. F. There is no calcining zone terminal differential which, in actual kilns, is responsible for a very high loss. It will be further noted that heat requirements per ton of CaO at the 100 percent efficiency point are very slightly less than 3,000,000 B.t.u.

The Ten Million B.t.u. Rotary

By contrast, there are many rotary kilns fired with this grade of coal which are using 10,000,000 B.t.u. per ton. That is a ratio of 2.78:1 and a thermal efficiency of only about 20 percent calculated by the available heat basis, which point is also located on the chart by a target.

In this we have distinguished between available and nonavailable heat. Latent heat of water vapor naturally is not available, but neither is that part of the sensible heat lost due to the inadequate amount of stone passing through the preheating zone. Efficiency, estimated on total heat basis, would be even less, only 26.1 percent, but the kiln cannot be blamed for the unavailable portion of the heat.

It is shown that at this efficiency point, the normal temperature of gases escaping from the kiln should be 1030 deg. F., which means there is sufficient stone to cool it to that temperature. But actually, in the case of any such kiln, it is always much more and likely to be between 1500 to 1700 deg. F. Therefore the excess temperature of these gases leaving the calcination zone, in the case of lime, is 500 deg. to possibly 700 deg. F. and, in the case of cement, up to 1200 deg. F., resulting in a very high loss. This terminal temperature differential loss, together with the cooler loss and radiation loss, constitute the three main streams of heat waste responsible for the poor kiln performance.

There seems to be a feeling that not much can be done about it but, if an understanding approach is made, very much can be done. Proportional fuel consumption may be reduced greatly and capacity be increased as well. After all, what is a 10,000,000 B.t.u. kiln but a relatively idle thermal duct leading gases to the stack?

With the chart in Fig. 3, we aim to present graphically the "why" of such inefficient rotary kilns. The graph is involved and deserves a prolonged study.

The chart is based on the previously mentioned coal, on 10,000,000 B.t.u. heat consumption per ton of 95 percent CaO product, on 1550 deg. F. stack temperature and nonrecuperative cooling of lime. Radiation loss was calculated from average kiln temperature, brick thickness, size of kiln (9 x 175 ft.) and, since the escaping gas temperature is above 1500 deg. F., all of the heat so lost was considered to originate from the high temperature stream.

Specific heat and heat of dissociation data used were as presented in

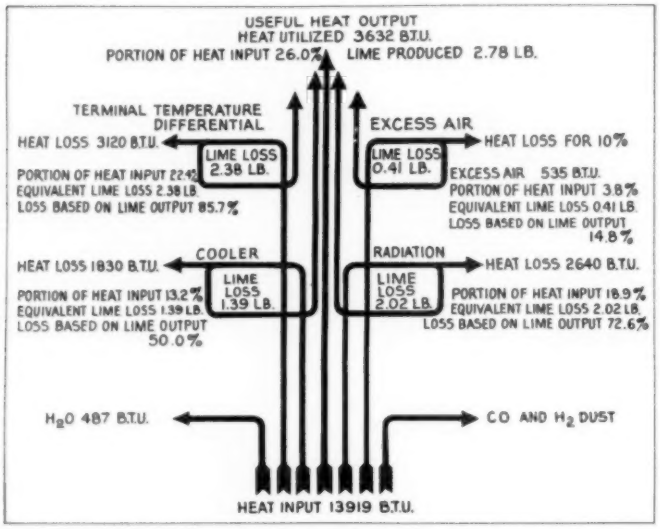

USEFUL HEAT OUTPUT
HEAT UTILIZED 3632 B.T.U.
PORTION OF HEAT INPUT 26.0%
LIME PRODUCED 2.78 LB.
TERMINAL TEMPERATURE DIFFERENTIAL
HEAT LOSS 3120 B.T.U.
LIME LOSS 2.38 LB.
PORTION OF HEAT INPUT 22.4%
EQUIVALENT LIME LOSS 2.38 LB.
LOSS BASED ON LIME OUTPUT 85.7%
EXCESS AIR
LIME LOSS 0.41 LB.
HEAT LOSS FOR 10%
EXCESS AIR 535 B.T.U.
PORTION OF HEAT INPUT 3.8%
EQUIVALENT LIME LOSS 0.41 LB.
LOSS BASED ON LIME OUTPUT 14.8%
COOLER
HEAT LOSS 1830 B.T.U.
LIME LOSS 1.39 LB.
PORTION OF HEAT INPUT 13.2%
EQUIVALENT LIME LOSS 1.39 LB.
LOSS BASED ON LIME OUTPUT 50.0%
RADIATION
LIME LOSS 2.02 LB.
HEAT LOSS 2640 B.T.U.
PORTION OF HEAT INPUT 18.9%
EQUIVALENT LIME LOSS 2.02 LB.
LOSS BASED ON LIME OUTPUT 72.6%
H_2O 487 B.T.U.
CO AND H_2 DUST
HEAT INPUT 13919 B.T.U.

Fig. 4: Lime balance, showing sources of kiln lime gain or loss for a rotary when requiring 10,000,000 B.t.u./ton of lime

Report No. 782 published in ROCK PRODUCTS, page 122, January, 1951.

The Heat Stream

A. Heat value of one pound of coal.

B. Loss due to completely unavailable latent heat of water vapor.

C. Heat developed which may become available to the process or not, depending on the layout and manner of operation.

D. Undeveloped heat due to escape of either CO, H_2 or CH_4 which in this case is ignored, but which often is of considerable proportions.

E. Portions of C heat of normal combustion products below the minimum calcining level of 1500 deg. F. Termed also heat of low elevations, as it is not directly available to the calcining process. It is usable mainly in preheating of stone but through recuperation and substitution may become equal in value to heat of high elevation.

F. Higher temperature portion of stream C. Heat of high elevation from which the useful heat of reaction is derived and in which the most serious losses originate.

G. Portion of stream F directly utilized in the calcining process and applied as heat of chemical reaction, the other portions Q, R, S, and T being wasted.

H. A part of this high level stream is used in heating lime above the calcining temperature, which then may be either lost or recovered from the cooler.

J. Heat abstracted from low level temperature stream in the preheating of carbonates.

K. Heat of preheating of extraneous materials and of unburned $CaCO_3$, all of which passes to the cooler. In the case of cement, stream K will be much greater in proportion to J and more heat will be delivered to the cooler in relation to the heat of calcination.

L. Heat returned to the low level temperature stream evolved in the calcination reaction by CO_2.

M. Stream contributing to the heat of calcination reaction originating from low level stream through the fact that heat of dissociation of carbonates is less at high than at low temperatures of reaction.

N. The total of sensible heat of magnesium oxide, calcium oxide and all extraneous materials at basic calcining temperature.

O. Superheat imparted to lime or cement originating in part from the high temperature stream and in part generated within the mass by exothermic reaction which in the case of cement clinker is predominating and quite considerable.

P. Total sensible heat in the lime or cement clinker leaving the kiln.

Losses of Heat

1. Sensible heat loss due to nonrecuperative cooling of lime or clinker which is represented by heat streams O and N. This loss has a counterpart in the loss "6" so its reduction gives both a primary and secondary benefit.

2. Radiation loss, high level heat, including all kiln surfaces losing heat from the 1500 deg. F. zone or higher, as well as all heat losses from fuel piping and cooler walls. This loss also has a counterpart in loss "6," because the higher the loss due to radiation the greater the stack loss.

3. Calcining zone terminal temperature differential loss. Heat carried by all the escaping gases and vapors due to the difference in temperature of incipient calcination.

4. Excess air loss. All heat carried from the calcining zone is escaping excess air at 1500 deg. F. Part of excess air loss that is over 1500 deg. F., stream R, becomes part of the loss due to terminal temperature elevation.

5. Incomplete combustion loss due to CO, H_2 and CH_4. In the case of vertical kilns there is a slight recovery of heat generated from combustion of C to CO while, in rotary kilns, due to the high terminal temperature differential, virtually all heat generated in burning carbon to CO becomes a loss.

6. Normal stack loss of normal products of combustion. Normal stack temperature for the prevailing fuel ratio would be only 1040 deg. F. and the loss would be the indicated 3288 B.t.u. Since the actual temperature is 1550 deg. F. it shows that gases are leaving the calcining zone at 2060 or at 510 deg. F. terminal temperature differential, increasing the normal loss by the magnitude of stream "3." This loss "6" is also completely dependent on the next "7."

7. The useful lime-making stream. The less there is of "7" the more there will be of "3" and "6." The more lime that is made the lower will be the stack loss.

8. There is a sensible heat loss due to dust.

Heat and Lime Balance

Ordinary heat balance tabulations of lime kiln performance would appear as the following, calculated for this kiln.

Heat balance, with coal heat value of 13,918 B.t.u. per pound

Heat in lime	3632 B.t.u.	26.1 percent
Stack loss	5370 B.t.u.	38.6 percent
Excess air loss	528 B.t.u.	3.8 percent
Water vapor loss	487 B.t.u.	3.5 percent
Radiation loss	1890 B.t.u.	13.6 percent
Cooler loss	1310 B.t.u.	9.4 percent
Incomplete combustion and unaccountable	701 B.t.u.	5.0 percent
	13,918 B.t.u.	100.0 percent

Stack temperature 1500 deg. F., excess air 10 percent, lime to cooler 2000 deg. F., nonrecuperative cooling.

This is heat balance, but it does not tell much and while the chart does tell, it is confusing. The stack loss could be dissected into normal and terminal but even that would not solve the problem of making it clear. However, this is accomplished by the chart in Fig. 4 presenting kiln lime production and loss balance. The chart charges the main losses directly with their representative lime loss, and so accounts for the great difference between the theoretical ratio of 9.2 of Fig. 2 and the actual ratio of only 2.78 obtained in the operation of the kiln.

It will be noted that in this chart

(Continued on page 126)

PREHEATER'S ROLE IN KILN EFFICIENCY

Tests indicate savings in fuel consumption of 25-35 percent attainable with either dry or wet process rotary kilns

THERE ARE STILL in operation many short rotary kilns of 40-60 meters in length, which are operating by the dry process and whose fuel consumption is relatively very high. As fuel prices have risen sharply, the question of the modification of these kilns becomes more urgent.

Generally, the lengths of these kilns are too short for special built-in arrangements, so that it is necessary to turn to a coupled preheater (calciners, concentrators, turbulent dryers).

One of the most important questions with the projection of such pre-equipment is: how will the temperatures of the gas and the material behave and will they be changed appreciably? Will the waste gas temperatures before and after the installation of a preheater remain the same or will they be increased?

By incorporating the results of many practical investigations, the following thermo-technical calculation was developed and the results were also interpreted in a Q-t diagram. The temperatures were calculated without air infiltration; however, with kilns with and without preheaters, they are comparatively lower according to the infiltering-air draft and the location of the measuring position.

Fundamental data were assembled for the combustion of coal dust with net calorific value of 7000 k.cal.*/kg., 0 percent H_2O, and an air requirement of n = 1.2; this gives a waste gas volume of 9.4 cu. meters/kg. of coal. It is also assumed for the calculation that two different kilns are not being compared but one and the same kiln, as for example, in this case, 3 meters dia. and 45 meters in length or 238 cubic meters internal kiln volume. Kiln A is a kiln without preheater and kiln B is the same kiln, but with the installation of a preheater. Differences in the two installations are indicated in Table I.

From these figures, which cover the results of numerous investigations, the following conclusions may be drawn: (1) The specific output in tons per cu. meter of internal kiln volume increases by 16 percent, i.e. the same kiln can be given a greater material feed. (2) The heat consumption (fuel consumption) decreases by 250 k.cal.*/kg. clinker equivalent to 16 percent thermal economy. This implies that the percentage addition of out air infiltration). In practice, the air leakage is sometimes great after sealing, if the sealing is unsatisfactory and the exhaust fan is of too large capacity. The following thermal calculations serve to give adequate proof that the waste gas temperature, after the installation of the preheater, is markedly increased. Here also it can be assumed, accord-

Table I. Combustion data for kiln operated with and without preheater

Kiln A (without Preheater)		Kiln (B (with Preheater)
Specific loading in tons/cu. meter of internal kiln volume	0.86	1.0
Loading in tons/day	205	238 = 16 percent increased output
Thermal consumption k.cal.*/kg. clinker	1,550	1,300
Coal consumption (percent)	22.1	18.6 = 16 percent thermal economy
Waste gas temperature deg. C. No air leakage at kiln	910	1,190
At preheater	—	480
Clinker temperature from cooling cylinder deg. C.	130	180
Raw material temperature kiln entrance	20	average = 500
H_2O in raw material feed (percent)	0	14
Decarbonation in kiln (percent)...	100	75
Decarbonation in calciner (percent)	—	25
CO_2 in percent after kiln	26.5	24
O_2 in percent after kiln	3.2	3.2
CO_2 in percent after preheater	—	27.7
O_2 in percent after preheater.....	—	3.2
Preheating of total combustion air by cooling cylinder heat deg C...	470	535

increase in kiln output corresponds to the same percentage addition in thermal economy.

In practice, with various kilns which are specially suitable for this purpose in terms of diameter and length, increased outputs and thermal economies of around 20 percent are obtained, which are figures for the dry process. With the wet process, for which the preheater also can be suitably adapted, thermal economies of 35 percent can be obtained. (3) The waste gas temperature at the kiln end, in the example considered, increases after the installation of the preheater by 280 deg. C. (with-

ing to the measurements, that on the average, a quarter of the decarbonation has already been achieved in the preheater. The raw material entry-temperature was assumed to average 500 deg. C.; it must, however, be somewhat higher, as part of the material is decarbonated, and partly lower.

(4) The kiln A (without preheater) generally operates with 0 percent H_2O in the raw material; with the installation of a preheater, it is best operated with 14 percent H_2O.

(5) A further interesting fact is that because of the partial decarbonation in the calcinator, the CO_2 content at kiln exit falls from 26.5 to 24 percent with the same oxygen content, but that it again rises to 27.7 percent

*The Large Calorie is the amount of heat required to raise the temperature of one kilogram of water one degree centigrade. It is therefore one thousand times as large as the small calorie.

The British Thermal Unit (B.T.U.) is the heat required to raise the temperature of one lb. of water one deg. Fahrenheit. As one kilogram is equal to 2.20462 lb., and one deg. centigrade is equal to 9/5 deg. Fahrenheit, the large calorie is 3.96832 (2.20462 x 9/5) times as great as the British Thermal Unit, the small calorie being 0.00396832 times the British Thermal Unit.

Translated and reviewed by B. M. Pearson from W. Anselm: Zement-Kalk-Gips (Vol. 3, No. 3)

following the preheater. These facts are extremely important for control by Orsat measurements.

For further results from investigations on rotary kilns with preheaters, using the dry process, reference can be made to W. Anselm and F. Spalovsky[1].

The thermal calculations in Table II, taking into consideration the individual endothermic and exothermic reactions in the combustion process, provide data on the amounts of heat available after passage through the kiln and the preheater. The basis for this calculation, which is not given in detail here, is covered in work which appeared in another publication[2].

From this heat flow calculation, it can be seen that the thermal performance corresponds to the thermal absorption and that the thermal waste gas losses must accordingly give the waste gas temperatures. In order to obtain a more accurate basis for this heat flow calculation, applicable to every case, the following control calculations were subsequently developed:

Table II. Heat flow calculations in k.cal.*/kg. clinker

	Kiln A	Kiln B		
		Kiln	Preheater	Total
Thermal Intake				
Coal	1550			1300
Heat in clinker	354			354
Exothermic	100			100
Heat in CO_2-H_2O	144			144
Total thermal input	2148			1898
Thermal Utilization				
Moisture expulsion	—	—	150	150
Heating up to 500 deg. C.	193	—	193	193
Expulsion of hydration water	41	21	20	41
Heating up 500 deg.-800 deg. C.	130	130	—	130
Decarbonation	484	364	120	484
Heating 800 deg.-1450 deg. C.	160	160	—	160
Sintering melt	25	25	—	25
Radiation of kiln and cooking cylinder	270	256	12	268
Waste gas losses	820	905	410	410
Clinker heat	25	37	—	37
Total thermal utilization	2148	1898	905	1898

(a) Control of the heat absorbed in the preheater

Heat in waste gas at kiln exit	905 k.cal.*/kg. clinker
Heat in waste gas at preheater exit	410 k.cal.*/kg. clinker
Heat used in the preheater: for:	495 k.cal.*/kg. clinker
Moisture removal	150 k.cal.*/kg. clinker
Heating	193 k.cal.*/kg. clinker
Partial removal of water or hydration	20 k.cal.*/kg. clinker
Partial decarbonation	120 k.cal.*/kg. clinker
Radiation from preheater	12 k.cal.*/kg. clinker
	495 k.cal.*/kg. clinker

(b) Control for gas volumes and temperatures

	Kiln A	Kiln B	
		Kiln	Preheater
Waste gas volumes in cu. meters/kg. clinker at exit	2.35	1.95	2.33
Waste gas heat content in k.cal.*/kg. clinker			
2.35 x 910 deg. C. x 0.384	820		
1.95 x 1190 deg. C. x 0.390		905	
2.33 x 480 deg. C. x 0.365			410
Waste gas temperature deg. C.	910	1,190	480

(c) Thermal balance control in k.cal*/kg. clinker

	Kiln A	Kiln B
Cement burning (including hydration of H_2O)	445	445
Moisture evaporation	—	150
Waste heat in clinker	25	37
Waste gas loss	820	410
Radiation and other losses	260	268
Heat consumption from fuel	1,550	1,310

The small difference amounting to 10 k.cal.* (1300 to 1310) is fundamental to the calculation.

(d) Amount of heat in waste gas control

Kiln A = 820 k.cal.*/kg. clinker
Kiln B = 410 k.cal.*/kg. clinker

410 k.cal.*/kg. clinker

From this, heat is absorbed in the preheater. In the preheater in case B, however, the heat is provided for the moisture evaporation, so that the final saving is: 410-150 = 260, which is about equivalent to the heat saving in the kiln B as compared with the kiln A: 1550-1300 = 250 k.cal.*

Waste Gas Temperatures

The waste gas temperatures would appear at first glance to be somewhat high compared with practical measurements. They are, however, calculated without consideration of air infiltration, because of the necessary calculation procedure and because every installation is not sealed to the same extent. With infiltrated air, figures prevailing in most practical operations probably are:

Kiln without preheater.. 800 deg. C.
Kiln with preheater.....1000 deg. C.
At exit to preheater .... 350 deg. C.

As sufficient heat is available in the waste gases, which still cannot be completely utilized, a certain amount of outside air entry at the entrance to the preheater will be found of use, to improve this detail.

The calculation shows clearly that the waste gas temperature of a kiln (under conditions of equal length), must be higher after the installation of a preheater. The following fundamental facts govern:

(a) Higher entry temperature of the raw material and consequently a lower thermal drop between the gas and the material.

(b) Eighteen percent of the total heat expenditure (consumption) is utilized in the preheater, which relieves the rotary kiln by this amount and by which, likewise, the temperature of the waste gases must rise.

The preheater, moreover, takes care of the moisture evaporation so that it is impossible to add more water to the mix which gives better grindability and serves to improve the operation of the preheater. The infiltered-air supply and the increased moisture certainly have definite significance if

1. W. Anselm, and F. Spalovsky: The Preheater with Rotary Kilns for the Dry Process: *Zement*, vol. 33 (1944), p. 55.
2. W. Anselm: Thermal Calculations in Kilns for Cement, Lime, Magnesite and Dolomite —Data for Output Research: *Radex-Rundschau*, 1950, p. 1.

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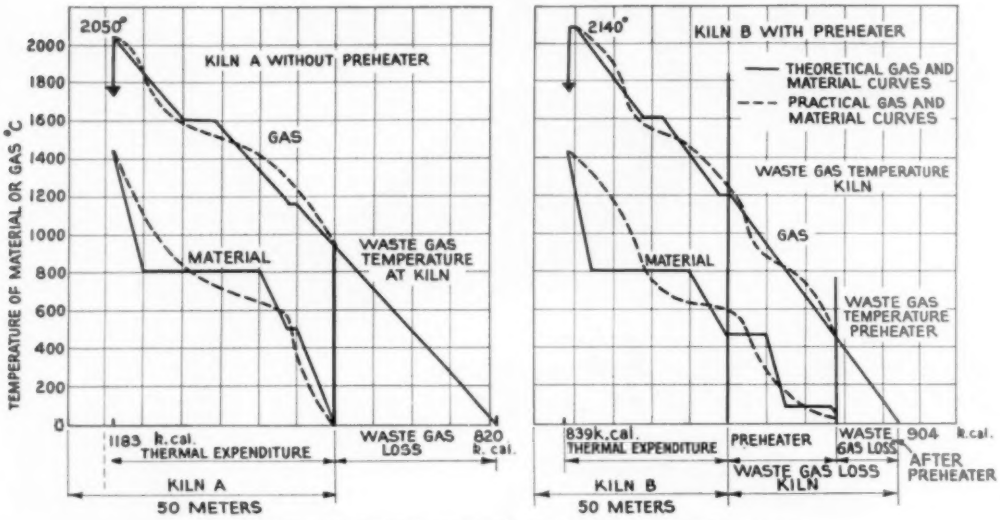

Heat relations in kilns with and without preheaters showing heat utilization and losses

a dust-recovery system is being installed, which is best operated at temperatures in the range of 300 deg. C. A small amount of increased power will result from this.

The total combustion air is preheated in kiln A to 470 deg. C., and in kiln B to 535 deg. C., so a higher flame temperature results in the combustion zone and, consequently, a smaller heat consumption.

The example calculated does not represent the actual economies or increased output achieved; in practical operation with the dry process the economies are generally around 20 percent.

According to practical experience, the specific output increases in tons per cu. meter of internal kiln volume per day as follows:

With 50-100 cu. meter internal kiln volume—from 1.0 (without preheater) to 1.3 (with preheater).

With 100-200 cu. meter internal kiln volume—from 0.9 (without preheater) to 1.15 (with preheater).

With 200-300 cu. meter internal kiln volume—from 0.85 (without preheater) to 1 (with preheater).

With both processes, either with or without the preheater, the amount of fuel used for heating per hour remains the same; the same amount of fuel is used in both cases and the only difference is that the output with the preheater is higher and consequently the specific heat consumption is lower.

With waste gas temperatures of 300 deg. C. to 400 deg. C. following the preheater, through a suitable arrangement, all of the raw material can still be dried which can result in a further economy of up to 150 k.cal.*/kg. of clinker.

With the higher temperatures available after the installation of a preheater, special attention must be paid to the rate of feed of the raw material.

The heat consumption calculated above, has been plotted on a Q-t diagram (above), where the theoretical and practical values of the temperatures and the respective thermal contents of gas and material are given. It can be verified that in kiln B, the flame temperature in the sintering zone increases because of greater heating of the combustion air as compared with kiln A. The course of the gas line to the abscissa cuts the respective heat losses, so that accordingly, a control of the heating process is secured.

The diagram above serves also as an indicator diagram of the heat relations in a kiln installation and provides actual conclusions regarding kiln dimensions and division of the individual zones and of the temperatures prevailing in these zones (linings). It can be easily calculated that kiln A must be almost 90 meters in length instead of 45 meters, in order to give the same results as with the installation of a preheater. (With consideration to the inadequate heat transfer relations between gas and material in the drying zone of kiln A, which is considerably better with the preheater). The preheater thus serves to save practically half of the kiln length, which should be given consideration in the case of new installations with preheaters. With consideration to the drying of the raw materials with the waste gases, it is possible, and this has already been achieved, to attain a figure of 1100-1150 k.cal./kg. of clinker.

To Move Stone Plant

FULLER LIME CO., Butler, Mo., has announced plans to move its lime plant from El Dorado Springs, Mo., to Rich Hill, Mo. The limestone at the new location is said to be quite extensive and of 96 percent calcium carbonate content. W. S. Fuller, Jr., is owner of the company.

Lawrence Company Report

LAWRENCE PORTLAND CEMENT CO., New York, N. Y., recently announced that its net income for 1950 was the largest in the company's history, exceeding 1926, the previous top year, by approximately 5 percent.

James H. Ackerman, company president, in his annual report to the stockholders, revealed that approximately $1,700,000 had been spent for expansion of the Northampton, Penn., plant. Plans for the modernization and expansion of the facilities at Thomaston, Maine, will call for the expenditure of about $1,500,000 more. Mr. Ackerman also reported that, subject to the approval of the stockholders, retirement plans have been agreed upon for the benefit of the hourly wage employes at both plants, together with a somewhat similar plan for salaried employes.

Lawrence also reports a perfect safety record for 1950, completing the year without a single lost-time accident in either plant.

•

A NEW LIMESTONE QUARRY has been opened recently near Parsons, Kan. and is being operated by John J. Stark. A crusher with a capacity of 65 to 70 tons of crushed stone and 40 to 50 tons of pulverized limestone per hour has been installed.

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MINING ENGINEERS DISCUSS PROGRESS IN DRILLING AND PULVERIZING

By OLIVER BOWLES*

THE 171ST GENERAL MEETING of the American Institute of Mining and Metallurgical Engineers met in St. Louis, Mo., February 19-22. A feature of special interest was the welcoming luncheon on February 19, at which President Donald H. McLaughlin introduced as speaker Arthur Holly Compton, chancellor of Washington University, who was intimately associated with development of the atomic bomb during World War II. He emphasized that atomic power was not only a powerful weapon, but might also be developed into an effective source of industrial energy. Willis M. Peirce, assistant to the general manager, New Jersey Zinc Co., Palmerton, Penn., became president of the institute at this meeting.

Some sessions were devoted to the broader aspects of world mineral resources, especially in their relation to the military program. A paper of general interest by Evan Just, editor of *Engineering and Mining Journal*, covered the relative availability of the principal metals and minerals to the Western Hemisphere, the Soviet Zone, and to certain intermediate zones. Fortunately, the Western Hemisphere is well supplied with most of the essential minerals, but suffers from serious shortages of chromite, cobalt, industrial diamonds and manganese. Shortages to a lesser degree are apparent for mercury, tin, tungsten and certain grades of asbestos. The author urged the necessity for an active and aggressive national policy to devise ways and means of meeting our deficiencies. The mineral potentialities of Soviet Russia were discussed by Paul M. Tyler. He pointed out that the country has extensive mineral resources, but development is far behind that of the United States. Many of the industrial centers are vulnerable to destruction.

Although the many sessions held pertained to every phase of mining and metallurgy, attention is directed herein primarily to the presentations that are of most interest to readers of ROCK PRODUCTS.

Symposium on Drilling

Jet Piercing. An outstanding feature of the meeting was a session devoted primarily to the newer types of equipment used for blast-hole drilling. D. H. Fleming presented a record of progress made in the method of making blast holes in rock by the process known as jet piercing. Although some tests were made as early as 1936, commercial-scale operations have been conducted only within the past two years. Linde Air Products Co., maker of the equipment, has been supervising commercial scale blast hole operations for the Erie Mining Co. at Aurora, Minn., on the Mesabi Range. The rock is a hard magnetic taconite. Operations have been continuous through two winters and one summer. The equipment consists essentially of a burner fed with oxygen and kerosene or other light fuel oil, and cooled with a heavy flow of water. The rock-cutting edge is a flame having a temperature of 4500 deg. F., and a velocity of 6000 ft./sec. While ordinary drilling methods employ mechanically induced stresses, this process depends upon thermally induced stresses which cause the rock surface to spall. The intense heat converts about 50 percent of the cooling water into steam which sweeps away the spalls, leaving a bare rock surface for continued exposure to the flame. The water performs three duties: (1) it cools the burner, (2) it quenches and embrittles any fused rock, and (3) it is converted in part to steam which carries away the cuttings or spalls. A maximum rate of 60 ft./hr. has been attained in uniform hard rock under the most favorable conditions, but for a long period under varied conditions the average rate is about 15 ft./hr. for 6½-in. holes. The equipment works best in hard, siliceous rocks. It does the work of about eight churn drills, and the cost per foot at present is about the same as for churn drilling. The heaviest cost item is oxygen, but if operations were conducted on an extensive scale this item would be relatively less costly. During the past year and a half at least 25 different burners have been tried as the design has been gradually improved. In view of the fact that the design is still in the development stage the results attained are quite encouraging. (See ROCK PRODUCTS, November, 1949, page 60, for details of operation).

Tungsten carbide bits. Progress made in the use of tungsten carbide drill bits was recorded by Eugene Lillstrom of the Cleveland-Cliff Iron Co. The drilling rate in hard rock has been reduced for a given depth of hole from 4½ hr. for steel bits to 2 hr. for carbide bits, but considerable difficulty has been encountered, because of drill shaft breakage and thread stripping. The latter cause has accounted for about ten percent of the drill discards. Chrome plating of the threads has increased the life considerably, but similar results were attained by making the threads larger. Drill life has been extended greatly by setting the carbide teeth directly in the rods, and using no threaded parts. About ten in. per min. is an average rate of penetration for tungsten carbide drills in hard rock.

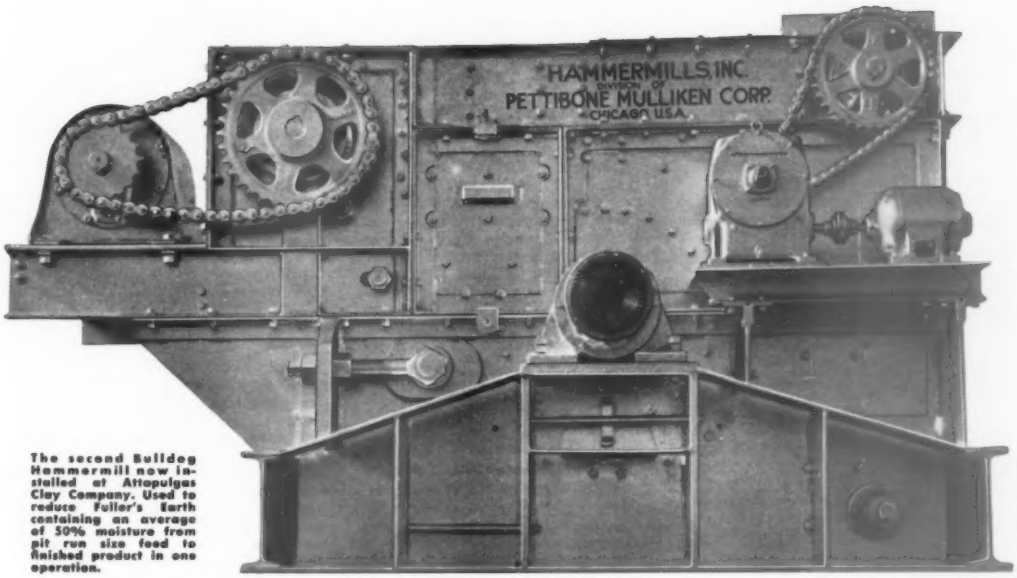
Rotary drills. A third method of blast-hole drilling, namely the rotary drill, was described by Samuel Levin of Joy Manufacturing Co. Drilling equipment for hard rock consists of a drill, a circulating medium, and a bit. The drill comprises a draw-works, a rotary table, and a feeding device. The circulating medium, which is used to cool the bit and remove the cuttings, may be a liquid, or it may be compressed air. Bits are generally of the rotating cutter type. The rate of penetration is governed largely by the weight applied, but excessive weight may result in rapid destruction of the expensive bit. In drilling hard rock the drill stem is always under heavy compression, and its design and handling become critical. Methods of feed are confined to mechanical pull down, or to the use of hydraulic cylinders. As a circulating medium compressed air has advantages over mud, but it involves dust-control problems. Rotary blast hole drilling is a comparatively new science, and much work is still to be done on design of bits and drillability of rock.

Microsize Pulverizing

M. F. Dufour of the Micronizer Co. described the operation of the micronizer as applied to the preparation of extremely fine-grained products, which are in demand for certain uses. A 5-micron product would be the equivalent of a theoretical screen size of 2500 mesh, and special equipment is needed to prepare such an impalpable powder. The grinding chamber which is relatively flat has an opening near the periphery for introducing the material to be pulverized, and a central concentric outlet for conveying the pulverized and classified product in suspension in the spent grinding fluid to a collector. Compressed air is a fluid commonly used, and the vents are spaced and directed to give maximum attrition of particles beating against each other. The units range in size from 2 in. to 30 in. The 2-in. unit will produce ½ to 4 lb. per hr., and the output of a 30-in. mill will range from 500 to 3000 lb. per hr. Costs range from $1 to $10 a ton, depending upon materials and fineness. The upper figure seems high compared with average grinding costs, but it must be realized that one particle of 325-mesh material must be broken into 680 particles to give a 5-micron product.

Closely related to methods of pulverizing are the methods of determin-

*Consultant in mining and geology



The second Bulldog Hammermill now installed at Attapulgas Clay Company. Used to reduce Fuller's Earth containing an average of 50% moisture from pit run size feed to finished product in one operation.

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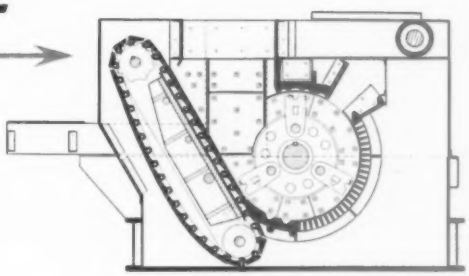
with Moving Breaker Plate →



For wet, sticky material reduction . . . for those tough, heavy-duty crushing jobs.

Illustrated above is the last word in Moving Breaker Plate Hammermill design. It is built by an engineering organization whose experience far surpasses any organization that might furnish Moving Breaker Plate crushing equipment.

Design Improvements have increased reduction efficiencies and lowered H.P. requirements. You can see this equipment in operation at any time. Also Hammermills will gladly survey your reduction requirements and recommend the proper equipment without cost or obligation. Just write or call.

Bulldog Hammermills are built in capacities up to 1000 tons per hour for every purpose: for primary, secondary, fine reduction of materials such as limestone, shale, Fuller's Earth, phosphate muck, phosphate mud balls, iron ore, oyster and clam shells, any reducible material.

HAMMERMILLS, INC., division of **PETTIBONE MULLIKEN CORPORATION**

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ing the degree of fineness obtained. A determination of particle size in the sub-sieve ranges is difficult, and some years ago methods were devised for expressing fineness in terms of surface area per unit weight of the powder, because the finer the material the greater the surface area becomes. Methods of measuring surface area have advanced from the more or less crude turbidimeter process to the permeability method in which a gas or liquid is passed through the sample, and to the low temperature gas-absorption method. F. W. Bloecher, Jr., of M.I.T. has developed a krypton absorption method which is said to be particularly suited to the needs of those concerned with finely ground mineral products. The method is too complex to be described here, but it marks another step in the precise determination of particle size.

Research on Crushing

Crushing is a major operation in the rock products industries, and, as yet, little is known about the theory of crushing. There is a wide discrepancy between the actual and theoretical energies needed in the fracture process. Much of the energy, of course, is converted into heat. The University of Minnesota is conducting studies on the relationship between energy input and the new surface produced in the crushing operation. Such work is slow and difficult, but it is hoped that eventually data will be assembled which will assist in the problem of improved crusher design.

Silica of Southern Illinois

J. E. Lamar of the Illinois Geological Survey described research studies being made on southern Illinois silica, which is essentially the same as the so-called tripoli deposits of Missouri and elsewhere. They are presumed to have originated from disintegration of siliceous limestones. Part of the silica is in the form of discrete particles, and when the lime carbonate is dissolved and removed they remain as a very fine-grained, soft powder. Another part of the silica consists of more or less connected particles which form spongy, porous masses of silica when the lime carbonate is removed. A third form in which the silica occurs is in more or less solid lenses or lumps of flint or chert. In practice all forms are ground together and sold as a fine, impalpable abrasive powder. The Illinois Geological Survey has been making a detailed study of the grain size, grain shape, composition, hardness and other physical properties of the products obtained from all three types. It is possible that some of the types have characteristic properties differing from those of the other types. If so, it may be desirable to mine and prepare them separately to satisfy special markets.

California's Mineral Wealth

Olaf P. Jenkins, chief of the California State Division of Mines pointed out that for three years in succession the annual mineral production of California has exceeded $1 billion in value, which is nearly three times the value recorded a decade ago. Petroleum is, of course, a big item, but industrial minerals are attaining increasing importance. Among the leaders are the $60,000,000 cement and lime industry, the $44,000,000 aggregate and stone industry, the $22,000,000 ceramic industry, the $31,000,000 saline industry, and the $6,000,000 gypsum and diatomite industries. As the state has an ample supply of most of the basic minerals needed in construction, ceramics and industrial chemistry, a continued future expansion is anticipated. The recent upsurge in population has initiated a new era of industrial development. Much intensive study is being devoted to the occurrence, mining, preparation, specifications and uses of a wide variety of industrial minerals.

Building Stones of Indiana and Minnesota

John B. Patton of the Indiana Department of Conservation described the famous Indiana limestone district which furnishes 80 percent of all building limestone produced in the United States, and 40 percent of the total building stone of all types. The Salem formation furnishes the valuable limestone. It is overlain by the St. Louis limestone which must be removed as waste. This is a costly operation because blasting must be avoided as it would fracture the underlying valuable stone. The waste is therefore channelled and removed as quarry blocks. The serviceable stone is cut with channeling machines into long strips about 6 ft. wide and 12 ft. high. These are turned down and are then subdivided by plugs and feathers into regular mill blocks. The stone is fabricated in highly efficient mills, and the products shipped to virtually every state and to foreign countries.

While limestone dominates the building-stone industry of Indiana, granite occupies the leading position in Minnesota. The famous St. Cloud granites have been used as monumental and decorative stone for many decades. George M. Schwarts of the University of Minnesota emphasized the importance of some of the distinctive types, particularly the Morton gneiss which when polished presents patterns and designs of great beauty. This stone is used as a decorative exterior to many large buildings, notably the postoffice in Knoxville, Tenn.

Foreign Industrial Minerals

Neighboring countries can at times furnish the United States with minerals that are in short domestic supply. Canada was well represented at the St. Louis meeting, and a symposium on Canadian minerals occupied two sessions. When the sulfur demand threatens to exceed the supply as at present, Canada has large reserves of pyrite at Noranda, sulfur-bearing smelter gases at Trail and Sudbury, and sour gases in Alberta. Canada furnishes the major part of our asbestos supplies, virtually all of our nephaline syenite, substantial quantities of fluorspar from Newfoundland, and gypsum from the Maritime Provinces. A sodium sulfate industry of some importance has been developed in Saskatchewan during the past three years. An ilmenite deposit in Quebec estimated to contain 100,000,000 tons of ore may become an important source of titanium oxide, now regarded as an essential paint constituent. Cuba is at times a source of chromite for the manufacture of refractories, and manganese of chemical grade.

Evaluation of Mineral Properties

An interesting feature of a session on cost accounting in mining was a paper by Bleeker L. Wheeler, consulting engineer, on the basic factors to be considered in determining the value of a mineral property. He pointed out the fallacy of simply estimating the reserves and multiplying that estimate by some arbitrary unit value, because that would give a present value to materials that would not be marketed for a great many years. Hoskold's formula for arriving at the present worth of a property is used by many valuation engineers. It generally assumes a very limited value of mineral reserves beyond 25 or 30 years of average production. Mr. Wheeler enumerated the various factors that are to be considered in arriving at a fair valuation. Among the more important, in addition to extent of mineral reserves, are markets, freight rates, future demand, competition, labor rates, labor availability, power, and transportation facilities.

The Industrial Minerals Division under the able leadership of chairman R. M. Foose of Franklin and Marshall College, Lancaster, Penn., completed an active year including several regional meetings. At the annual meeting in St. Louis as covered by this brief review, numerous papers were presented on a wide variety of subjects. At this meeting Dr. A. B. Cummins of the Johns-Manville Research Center, Manville, N. J., took office as the new chairman.

Guatemalan Cement

CARLOS F. NOVELLA & CIA., Guatemala City, Republic of Guatemala, C. A., has announced that since the completion of plant installations in February, 1950, there is no longer a cement shortage in Guatemala. The company now produces 1100 bbl. of portland cement per day. The sale of cement in Guatemala during 1950 reached an all-time high of 975,000 bags, or an average monthly sale of 81,000 bags. This leaves an excess of 39,000 to 49,000 bags per month available for export. Government controls on free sale of cement were removed as of June, 1950, and consumers are therefore free to purchase whatever amount they may require.

Loading stone from the quarry, this GM Diesel-powered 1½-yard Koehring handles 150 tons an hour on less than 4½ gallons of fuel.

20% HIGHER PRODUCTION at ⅓ the fuel cost

Cowan Stone Company, Cowan, Tennessee, wanted another make of Diesel when they bought their Koehring 605 shovel in 1948. But it was readily available with a GM Diesel engine, so they took it.

And when they recently converted a 21-year-old 1¼-yard shovel from gasoline to Diesel power, what engine do you think they installed? Another GM Diesel, of course!

With its smooth, steady flow of power, this veteran machine now stock-piles 125 yards an hour—approximately 20% more than it did before—and uses only 3 gallons of Diesel fuel per hour as compared to 7 gallons of gas.

Figure the savings in terms of your own operation. Then call in your nearby GM Diesel distributor. Ask him to show you how simple and economical it is to convert to this modern 2-cycle Diesel power.

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SINGLE ENGINES...*Up to 275 H. P.* **DETROIT 28, MICHIGAN** MULTIPLE UNITS...*Up to 800 H. P.*

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

Kiln Efficiencies

(Continued from page 116)

the normal stack loss has disappeared since there would be but little of this loss if it would not be for the terminal, excess air, cooler and radiation losses.

Any high level heat loss has a resultant increase in low level heat loss which in this case of high grade coal and high calcium lime are in the ratio of 71.5 percent high level to 28.5 low level heat. In view of this, any high level heat loss must be multiplied by 1.4 to give the true loss. For example, if direct cooler loss is 1310 B.t.u. there is a corresponding stack loss of 520 B.t.u. to make a total of 1830 B.t.u. So the true loss due to nonrecuperative cooling of lime based on heat input is not 9.4 but rather 13.15 percent. Then since 1310 B.t.u. are required per pound of lime produced, by dividing 1830 by 1310 the lime loss due to nonrecuperative cooling is 1.39 pounds, which is a loss in lime production of 50 percent.

In view of the above, the radiation loss may be calculated in three ways:

Direct high level heat loss ..... 13.6 percent

High level and corresponding low level heat loss.. 18.9 percent

Loss of high and low heat combined expressed as lime ..... 72.6 percent

The losses as above tabulated represent 6.2 pounds of lime while the kiln produces 2.78 pounds of lime per pound of coal or a total of 8.98 pounds which is not far from the theoretical 9.2 pounds. The difference is chargeable to the unavoidables and the unaccountables.

The equivalent of almost 6 pounds of lime loss is ascribable to the cooler, radiation and terminal temperature differential and much can be done to minimize all three of them. But it must be done in such a way that while one is reduced the others are not increased, which can readily occur as they exist in a state of delicate balance.

This matter of minimization of these losses will be discussed in the next article of this series.

The Lime Balance

Loss	Actual loss of high level heat	Cor. loss of low level heat	Combined loss	Equivalent in lb. of lime	Percent loss based on lime
Cooler	1310 B.t.u.	520 B.t.u.	1850 B.t.u.	1.39	50 percent
Terminal Temp Dif.	2232 B.t.u.	888 B.t.u.	3120 B.t.u.	2.38	85.7 percent
Radiation	1890 B.t.u.	750 B.t.u.	2640 B.t.u.	2.02	72.6 percent
Excess Air	382 B.t.u.	153 B.t.u.	535 B.t.u.	.41	14.8 percent
Total of Losses				6.20	

Southern California Associations Honor Engineer

ON FEBRUARY 23, 1951, the Southern California Rock Products Association and the Southern California Ready Mixed Concrete Association held a dinner in honor of Stanton Walker, engineering director of National Sand and Gravel Association and National Ready Mixed Concrete Association.

The rock, sand and gravel and ready-mixed concrete industries were represented by many California companies.

In attendance were Los Angeles officials, structural engineers and chemists, members of various societies and trade association officials. Industrial officials and publications representatives were also present.

Canadian Cement Co. Expands

CANADA CEMENT CO., LTD., Montreal, Can., which supplies most of the Canadian requirements of portland cement, has an annual capacity of 14,000,000 bbl. of cement, but capacity is expected to be increased to about 16,000,000 bbl. with the completion of two major expansion projects now under way. A new plant being built at Havelock, New Brunswick, will have an annual capacity of 800,000 bbl., and the plant has been so designed as to allow for expansion with a minimum of added cost when necessary. Operation at this plant is scheduled to begin in July, 1951. The other expansion project will provide an additional 1,200,000 bbl. of cement from the Exshaw, Alberta, plant. Preliminary construction work is now under way at this plant.

The company's cement sales for 1950 were 5 percent above those of 1949, with net earnings gaining slightly more. There is considerable amount of construction work now under way in Canada which will require large amounts of cement, and specific military requirements are also expected to increase the demand. But if Canadian demands do not exhaust the company's capacity, the excess supply is expected to be absorbed in the United States, due to expected shortages.

Cement Plant to Expand

ALPHA PORTLAND CEMENT CO., Easton, Penn., has announced an expansion program, estimated at a cost of $750,000, for its Ironton, Ohio, plant. The construction work will include new silos for cement storage, a new packhouse and storage for bags.

The new construction will provide added storage facilities to enable the plant to greatly increase its production. Present storage capacity includes about 180,000 bbl. for cement and 75,000 bbl. for clinker which is stored for grinding.

Members and guests of the Southern California Rock Products Association and the Southern California Ready Mixed Concrete Association at a dinner given in honor of Stanton Walker, at the Biltmore Hotel, Los Angeles, Calif., on February 23, 1951

SIMPLICITY SCREENS KEEP COSTS DOWN FOR CALIFORNIA SAND AND GRAVEL PRODUCER

Operating view of Torrance Sand & Gravel Co. installation in California.

Two Simplicity Gyrating screens keep production rolling for the Torrance Sand & Gravel Company in Torrance, California, and *take all kinds of material in stride.* In this installation a 4' x 14' Model D Triple Deck Screen scalps off rock ranging from 2" to 16" in size and removes all the minus ¼" material making concrete and plaster sand. All final gravel sizing and washing is done on a Simplicity 3' x 8' Triple Deck Screen.

Like Torrance Sand & Gravel, operators all over the country have found that Simplicity screens are better for sizing and dewatering because they are *big* for their size . . . *they give more screening area.* A 3' x 8' Simplicity actually gives 3' x 8'— 24 square feet — of live action area. Simple mechanisms mean minimum maintenance . . . famous gyrating action means more production of a quality product. Get the facts first about Simplicity for *screens that will last.* A Simplicity sales representative will be glad to give you the complete story. Write, wire or phone us at Durand.

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- **Sales Representatives in All Part Of The U.S.A.**
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- **For Export:** Brown & Sites, 50 Church Street, New York 7, N. Y.

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY, DURAND, MICHIGAN

N.S.G.A. Convention

(Continued from page 112)

When John Roberts asked about the shrinkage of pumice, Mr. Spratlin said the best way to compensate for the loss in shrinkage was to use a little more aggregate.

One producer said that he added 35 percent sand to pumice and in such cases his shrinkage compared to that for ordinary concrete.

The question was asked about the use of fly ash by small operators and Stanton Walker summarized its use by saying that fly ash differed in its chemical and physical characteristics but that some fly ash could be used; however, it took up to a year's time for strengths to develop and in the 7-28 day tests, fly ash would not show added strengths in the concrete.

John Roberts asked about tire wear and axle failures where one hauled 8 cu. yd. of concrete. One speaker said that with 3-axle jobs using 12 x 24 tires no chassis failures had developed in two years. The speaker also said that they had more trouble with axle failure on 2-axle jobs hauling 6 cu. yd. of concrete than they did hauling 8 cu. yd. with 3-axle carriers.

The second speaker on the program was Fred C. Bond, technical director, Basic Industries Research, Allis-Chalmers Manufacturing Co., Milwaukee, Wis., who gave a paper prepared jointly by himself and Frank E. Briber, Jr., acting engineer in charge, Crushing and Pulverizing Department, Basic Industries Machinery Department of Allis-Chalmers Manufacturing Co. The paper, "Principles of Crushing," included a discussion of the theory of crushing, energy input required, particle size distribution, crushability tests, particle shapes, general types of crushing equipment, and the characteristics and limitations of the various types of crushers.

Among his more interesting comments were the following:

"Rock is ordinarily broken under compression, but shearing and tensile forces can also result in breakage. It is only necessary that the resultant of the induced strain exceed the critical breaking strength in the same direction.

"The reduction ratio is the feed size divided by the product size. The number of pieces of product formed from one piece of feed equals the cube of the reduction ratio. If it is assumed that the minimum break necessary to relieve the strain is the breakage of one piece into 8 pieces, with a reduction ratio of 2, then the theoretical work input required is proportional to one-half the square of the compressive strength divided by the modulus of elasticity and multiplied by the reduction ratio minus 1. The new surface area formed is also proportional to the reduction ratio minus 1; however, the new surface area formed in crushing a given quantity of rock is inversely proportional to the feed size, while the theoretical strain energy input is independent of the feed size. According to the surface energy theory, the efficiency of crushing and grinding is the ratio of the surface energy produced to the kinetic energy expended.

"The size which 80 percent passes has been chosen as a convenient measure of the effective particle size, and can be found readily from the plotted screen analysis. The size which 100 percent passes is not a satisfactory criterion, particularly since the largest particles are usually slabby and do not follow the straight line plot. The reduction ratio is taken as the size *F* which 80 percent of the feed passes divided by the size *P* which 80 percent of the product passes. The reduction ratio is constant for all sizes when the plotted size distribution lines of the feed and product are parallel."

Mr. Bond, in discussing energy requirements, made the following comments: "Theoretical explanations of crushing phenomena have not been of much value in predicting crusher performances. The principal reason for this is the wide variation in rock structures, and the existence of various structural zones of weakness which may make large pieces of rock relatively easier to crush than the same amount of smaller pieces. Measurements of compressive and impact crushing strengths are made on pieces of specified sizes, and the results of duplicate tests may vary widely, so that the average of several tests is required to evaluate the crushing resistance at the feed size used."

Scanning the morning papers are Robert J. Hummel, left, and William B. Ryan, both of the Consumers Co., Chicago, Ill.

The speaker, in discussing particle shapes of crusher products, said: "The shapes of crushed rock particles are highly irregular. The particle of unit volume having minimum surface area is a sphere, and crushed particles vary from this theoretical minimum to cubical, rectangular, tabular, and acicular. Particles which combine sharp corners with minimum surface areas per unit volume are commonly designated as cubical and usually constitute the most desirable rock products, since they combine good interlocking properties with good individual particle strength."

In the second portion of the paper, the speaker discussed crushing operations in general, with emphasis on the application of crusher equipment to the production of sand. He classified crushers into the following groups: gyratory, jaw, double and single roll, hammermills, and (for sand) the rod mill and discussed them briefly, both with reference to their class and the stage of application.

The speaker, with reference to primary crushers, said a jaw crusher will usually give a slabbier product than a gyratory and often the slabbiness resulting from the primary crusher can be reduced by a judicious

D. D. Reynolds, Cambridge, Mass., left, and Charles E. Brady, Salisbury, N. C., taking a stroll at the Jahncke estate

Mr. and Mrs. Walter H. Acheson, Urbana, Ill., at the Jahncke estate

Special service is rendered guests at the Jahncke estate by Wayne W. King, left, and E. J. Hunan

Low Cost Crushing-

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Bantam Buster Single Roll COAL CRUSHER

—with cut Gears—Segment Rolls and Renewable Crushing Plate Tips

Crush hard or soft coal in strip or underground operations with the dependable, low cost McLanahan Bantam Buster *Single Roll* Coal Crusher. This machine crushes coal to desired size, with a minimum of operating and maintenance expense.

Bantam Busters have a high ratio of reduction and are portable, self-contained units, adaptable for any installation. They are furnished with 18" diameter roll up to 48" wide, and 24" or 30" diameter roll up to 60" wide. Crushing plate is quickly and easily adjusted to vary size of product. Roll and counter-shafts are carried on babbitted or self-aligning roller bearings. Investigate the possibilities of this machine for your operation.

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selection of the crushers that follow the primary operation.

He made the following remarks:

"The elimination of primary fines may do considerable to eliminate slabs in the final product. This is understandable when one considers the usual practice of scalping out the product size material ahead of each successive stage of crushing. If the primary fines contain a high percentage of slabs, as may be the case, and if they are not removed, they will pass on through the plant in their original form and end up in the final product.

"Experience has shown that too great a ratio of reduction in any given crushing stage will result in the production of an excessive amount of fines and slabs. This is more apparent and of more importance in the later crushing stages, but nevertheless holds for primary crushers as well."

The speaker classified secondary crushers as usually being gyratories or similar to gyratories in design but having modified crushing chambers, or of the cone type. He said cone crushers were usually tertiary or quaternary crushers. He discussed the various types of crushers.

In discussing tertiary and quaternary crushers the speaker made the following comments:

"Hammermills almost invariably produce the most cubical product of any crusher, but on abrasive materials the maintenance is high. The selection of a hammermill is frequently an economic one with low initial cost for relatively high capacity machines balanced against higher maintenance costs. A good sand product can usually be obtained from a hammermill, although in some cases an excess of fines may be produced. Also the gradation of the product may be poor and considerable blending may have to be resorted to if a rigid product specification must be met. The material should be relatively dry.

"Cone crushers of various manufacturers are probably the most widely used tertiary crushers, and have been used for the production of sand, although it is usually felt that the product required is somewhat finer than can be economically produced in a cone crusher. Most sand specifications call for minus 4-mesh material and it has been our experience that production of this size material in any quantities in cone crushers is beyond the limitations of good crushing practice. Cone crushers provide the ease of adjustment and tramp iron protection required in a tertiary crusher and are considered high capacity units. The product, although not normally as cubical as that from a hammermill, can be made quite satisfactory, particularly if care is exercised in the application of the crusher. Our experience has indicated that the production of a cubical product is to a greater or lesser extent dependent upon the eccentric throw of the crusher—the greater the eccentricity with respect to the setting, the more slabby will be the product. A crusher with a small throw is more likely to produce a cubical stone than one with a larger throw. However, everything else remaining equal, a small throw means a small capacity. With an increasing demand for fine stone and sand, all too frequently a larger capacity is selected to the detriment of quality.

"Double roll crushers are frequently used for the production of the finer sizes of crushed stone and sand. They have the required tramp iron protection, and can handle damp or sticky materials better than any other tertiary or quaternary crushers. They are, for the most part, rather difficult to adjust, and require considerable care in their operation, especially the feeding arrangement, if grooving and uneven wear of the roll surfaces is to be avoided.

"Crushing rolls will probably produce fewer fines than either hammermills or cone crushers, but at the same time, the product is apt to contain more slabs than that of either of the other two types of crushers. Because of this, the product frequently will not pass U. S. Engineer's specifications.

"Some work has been done using differential speed rolls with speed ratios of up to 2:1. Considerable improvement of the product usually results and the slabbiness is reduced, but the wear on the roll shells increases to the point where the economics are doubtful.

"The use of hammermills, cone crushers or crushing rolls in the production of sand almost invariably requires closed-circuit crushing, and it might be well to outline some of the advantages and disadvantages of this procedure. It might be said that it is well to avoid this wherever possible, although it does have some advantages and is mandatory if a definite top size limitation exists. By the use of closed circuit crushing the production of fines can be reduced somewhat and it is likely that the slabbiness, especially in the larger sizes, will be somewhat reduced because these slabs will be returned to the crusher where their chances of becoming broken are increased. The undesirable features of closed circuiting are economic ones. The capacity of the crushing equipment must be increased in order to handle the circulating load, or conversely, the capacity of the individual machines will be reduced by the amount of the circulating load. Additional conveying and screening equipment is required, which increases initial cost and also operating and maintenance costs.

"The biggest advantage of a rod mill lies in the number of ways in which the final product can be controlled. The feed size, which normally lies between ¾ in. and ⅝ in., the amount of water, i.e., dilution, the rod charge, the mill speed, etc., are all factors which can be varied to produce changes in the final product. Rod mills tend to give a higher percentage of the finer sizes which are frequently lacking in a crusher product. They usually can be applied in such a way as to permit open circuit milling, with the amount of oversize falling within specifications, something which cannot usually be done in a crusher. The extreme fines may have to be removed from the final product through wet or dry classification.

"Summarizing the above, our experience has indicated that the most cubical product will be produced by a hammermill followed by a rod mill, a cone crusher and a double roll crusher in that order. Maintenance will probably be highest on a hammermill, followed in order by crushing rolls, cone crusher and rod mill. The control of the product is the greatest with rod mills, and there is little difference between the control obtainable with any of the crushers. The initial investment is greatest with the rod mill."

In the discussion that followed, J. L. Shiely, Jr., J. L. Shiely Co., St. Paul.

(Continued on page 136)

The hosts at the Johncke estate had their pictures taken with V. P. Ahearn, who is on the right. Left to right are: Mr. and Mrs. Paul E. Johncke, Jr., and Mr. and Mrs. Herbert G. Johncke

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Designed and built to move big loads of rock and heavy excavation, Rear-Dump "Eucs" are cutting haulage costs at quarry and open pit mining operations in all parts of the world.

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Two shovels of 3½ yd. capacity load the well-blasted stone into Euclids for a haul of 3,070 feet to the plant. Maximum grade on the loaded haul is 9.5%. During an eight-hour shift, the Euclids make 340 trips, hauling 5,440 tons. Production of lime and crushed stone for agricultural and industrial use averages from 600 to 700 tons per hour.

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The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

AND IN THIS CASE, it's all the good Multiwall Specialists coming to the aid of American manufacturers whose packaging problems are increasing with the national emergency.

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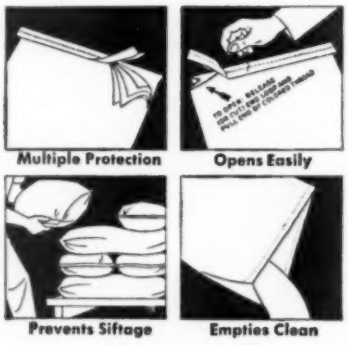

UNION Multiwall Bags

UNION BAG & PAPER CORPORATION

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INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below

1 AIR VIBRATOR — Cleveland Vibrator Co. has released a pamphlet on its line of air vibrators, describing and illustrating dimensions and installation, and including a special layout data sheet.

2 ASH HANDLING—Beaumont Birch Co. has released a booklet which describes and illustrates hydraulic and pneumatic ash and fly ash handling systems, compiled in question and answer form. Schematic drawings, diagrams, and discussion of elements of the various systems are listed.

3 BAGS—Bemis Brothers Bag Co. has issued a 20-page booklet, describing and illustrating ways to use all types of multiwall paper bags with more efficiency and economy. The bulletin deals with the storage of empty bags; filling, closing and handling of filled bags; palletizing and other related topics.

4 BUCKETS—George Haiss Mfg. Co., Inc. has published an 8-page bulletin, No. H-350, describing and illustrating clamshell buckets for excavating, rehandling, and trenching. Construction features, capacities, dimensions, and specifications are listed.

5 CALCIUM CHLORIDE—Calcium Chloride Association has announced the "News," a bulletin published six times a year for the purpose of reporting to key individuals general information on the many uses of calcium chloride. The literature consists of research and engineering reports, and application procedures, written informatively, but not too technically.

6 CONVEYOR SYSTEMS—Link-Belt Co. has started distribution of its 1296-page General Catalog 900, which contains many tables and charts of basic data facilitating the design and selection of conveyor systems, chains and wheels, drives, power elements, etc. A primary function of the book is service as a reference tool.

7 CRUSHING & SCREENING — Pioneer Engineering Works, Inc. has published its 10th edition of "Facts and Figures," a pocket-size booklet of information on crushing, screening, washing, materials handling and aggregates. Included in the booklet are tables on stage of reduction, capacities, selection, and miscellaneous information such as weights, measures and conversion factors.

8 CRUSHING EQUIPMENT — Taylor-Wharton Iron & Steel Co. has published Bulletin 350, dealing with Tisco manganese steel parts for crushing and pulverizing equipment; and discussing the Timang welding rod. Complete descriptions and photographs are included.

9 CUNILATES—Scientific Oil Compounding Co., Inc. has issued a 22-page booklet, describing and illustrating a complete line of Cunilates available for the specific requirements of any fungiciding problem. Types of Cunilates for textiles, protective coatings, vinyls, paper, leather, etc. are discussed.

10 DIESEL ENGINES—Worthington Pump and Machinery Corp. has announced an 18-page bulletin, No. S-500-B52A, describing and picturing a new line of DR diesel engines; 4-cycle, direct injection, and totally enclosed models. Cutaway line drawings, photographs and specifications are included.

11 DRILLS—Acker Drill Co., Inc. has published Bulletin 33, describing and illustrating its complete line of drilling equipment developed during the past 30 years. Included are capacity and construction data and photographs.

12 DRYERS—Standard Steel Corp., Standard-Hersey Dryer Div., has issued Bulletin 500, describing and illustrating industrial and agricultural applications of its more than 30 types of dryers, including continuous and batch dryers and rotary kilns, coolers and calciners. A special section is devoted to the company's new pilot dryers.

13 DUMP TRUCKS—The Euclid Road Machinery Co. has published an 8-page catalog, describing and illustrating various features of off-highway hauling units designed and built for moving earth, rock, ore and other heavy excavation. Complete specifications are included.

14 ENGINES—International Harvester Co., Industrial Power Division, has a new folder available, No. A-317-NN, entitled, "High Production, Low Costs . . . With International Pit and Quarry Power," describing and illustrating various quarries that use International power units, along with the users' statements. There is also a work capacity chart covering the company's line of carbureted and diesel power units.

15 FANS—The Green Fuel Economizer Co., Inc. has brought out Bulletin No. 168, containing 20-pages illustrated with drawings of typical fan types and photographs of installations and describing several performance curves showing efficiencies of various types of fans over a range of speed and delivery conditions.

16 FORK TRUCK GUARD — Towmotor Corp. has released an accessory sheet, No. AD-5, dealing with the overhead guard device for use on fork lift trucks and illustrating, by photographs, the machine itself and pertinent usage. Dimensions, weights and method of attachment are discussed.

17 FORM SYSTEM—Symons Clamp & Mfg. Co. has brought out a 4-page bulletin describing and illustrating in condensed form its forming system for concrete wall construction. The system and what it consists of, Symons form system service, and other products for concrete work are described.

18 GRAVEL PLANT—Universal Engineering Corp. has issued bulletin No. US01, which describes and illustrates its 293Q5 Twin Dual gravel king, which is a complete portable gravel crushing, screening and loading plant. Diagrams illustrate the various product combinations available.

19 HARD FACING—Stulz-Sickles Co. has released an illustrated folder, describing Manganal for the repair of worn buckets. The pamphlet covers many applications for which this special analysis of manganese-nickel steel is used.

20 IMPACT BREAKER—Iowa Mfg. Co. has issued an 8-page bulletin, No. IMP-1, which illustrates and describes the Cedarapids double impeller impact breaker, giving details of breaker action. Construction features are covered, and dimensions and specifications are given.

21 INDICATORS — Wheelco Instruments Co. has published a condensed catalog covering a selection of indicators, controllers, and combustion safeguards and illustrating these by means of photographs. Accompanying the bulletin is a 4-page price list . . . containing listing, description and current price.

22 LABORATORY SAFETY—Fisher Scientific Co. has published a newly revised edition of the 40-page booklet entitled "Manual of Laboratory Safety." Recently developed data, techniques and equipment are included.

23 LIFT TRUCKS — Barrett-Cravens Co. has offered Bulletin No. CP478, illustrating and describing spring frame lift trucks for handling fragile materials. Standard lift is 2¾ in. and they are available in capacities of 4000 to 6000 lb.

24 LUBRICANTS — Keystone Lubricating Co. offers a 30-page edition of its application guide, describing and illustrating the line of lubricants for industrial and automotive machinery. Information covers lubrication of bearings, power generation, transmission, etc.

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25 LUBRICATION—U.S. Electrical Motors, Inc. has presented a bulletin, No. 1570, describing and illustrating comparative amounts of lubricant in different designs of bearings and how bearings are subject to air circulation.

26 LUGS — Tweco Products Co. has announced its Form No. SL-51 illustrating and describing three Tweco products, soldering lugs, splices, and block and punch . . . all companion items. Photographs, specifications, and price information are included in the publication.

27 MATERIALS HANDLING—Clark Equipment Co., Industrial Truck Division, has announced a condensed catalog describing and illustrating its line of materials handling equipment. Basic specifications are listed for such models as forklift trucks, industrial towing tractors and its complete line of special attachments for particular needs.

28 MILL—Western Machinery Co. has released an 8-page bulletin describing and illustrating prefabricated heavy media separation plants for coal cleaning. Specifications include tables of capacities, dimensions, and requirements for power, water and media.

29 MOBILE CRANE—Bay City Shovels, Inc., has issued a 24-page catalog describing and illustrating its CraneMobile, available in 20 and 25 ton capacities, and showing the CraneMobile carrier which can be had in five models. The machinery assembly, and application of the crane on a variety of jobs are included in the bulletin.

30 MOTORS & GENERATORS — Westinghouse Electric Corp. has announced a 19-page booklet, No. B-4595, describing and illustrating the new Life-Line type SK d-c motors and generators. The booklet pictures and discusses types, enclosures and mountings for many different applications.

31 PIPE MACHINE — Martin Iron Works has published Bulletin No. 48, describing and illustrating Model 48 concrete pipe machine which makes pipe from 4 to 24 in. inside diameter with production up to two joints per minute, the manufacturer claims.

32 RUBBER MOUNTING—The B. F. Goodrich Co. has introduced a catalog section, No. 7290, describing and illustrating the Vibrapad, a rubber pad, 12 in. sq., together with rubber tubes and snubbers from which individual mountings may be fashioned. Photographs and cutaway sketches of installations on vertical and inclined machines are pictured.

33 SAFETY BELT—Mine Safety Appliances Co. has published a 4-page bulletin, No. CF-26, describing and illustrating body type, harness type, bridge and structural steel workers', and linemen's belts among others. In addition, accessory equipment such as steel tail lines and lanyards are included.

34 SHOVELS — Marion Power Shovel Co. has published a bulletin, No. 402, describing and illustrating the Marion type 111-M machine, which is equipped with diesel power, electric swing and air control, and available for service as a shovel, dragline, clamshell, crane or long range shovel, the manufacturer claims. This machine is for service in the construction and mining industries, etc.

35 SHOVEL—Service Supply Corp. has released an 8-page catalog, Bulletin No. LO 200, describing and illustrating the Lodover, a 1-cu. yd. combination overhead and front-end shovel for International Harvester tractors. New design features, attachments and specifications are included.

36 SLINGS — Macwhyte Co., Sling Department, has released a pocket size card, No. 50-38, describing and illustrating proper care and use of slings for safe handling.

37 SPEED REDUCER—The Falk Corp. has brought out a 23-page engineering bulletin, No. 2110, describing and illustrating vertical right angle speed reducers with Falk patented oil pumps and anti-friction bearings, rated according to American Gear Manufacturers Association standards. Overhung load and thrust load values, flange thrust couplings and flexible couplings are among the many specifications indicated.

38 STARTERS — Allis-Chalmers Mfg. Co. bulletin No. 14B6410A describes and illustrates Type H motor starters for 2300 to 5000 volt squirrel cage wound rotor and synchronous motors. Photographs, dimensions and construction information are included.

39 STORAGE BINS — The Neff & Fry Co. has issued a pamphlet describing and illustrating storage bins which are manufactured with a diagonal-ended "super concrete" stave, for density and strength, the company states. Photographs of typical installations are reproduced and data tables showing capacities are included.

40 THAWING PITS — Hauck Manufacturing Co. has released Bulletin No. 1040, describing and illustrating its thawing pits which employ the radiant method of heating coal hoppers. Charts, diagrams and complete specifications are included in the pamphlet.

41 TRACTORS—Caterpillar Tractor Co. has published a booklet entitled "Service Reporter," describing and illustrating helpful hints and basic information on keeping equipment in good working condition. Service requirements for winter is the general subject of the booklet.

42 TRUCKS — Lewis-Shepard Products, Inc. has released a 16-page bulletin, No. 29, covering and illustrating the standard line of two wheel and four wheel trucks used by warehouses, industry and trucking companies. Specifications include size, weight, running gear and capacities.

43 VALVE — The Farval Corp. has issued its bulletin No. 60 describing and illustrating the sprayvalve which, the manufacturer states, may be used to spray either grease or oil onto open gearing, slide surfaces and other areas. Diagrams and instructions for use are shown.

44 VISE—Dodge Manufacturing Corp. has released Bulletin A-601, describing and illustrating a slide-set vise. Photographs and data for operation, list prices and design features are included.

45 WATER GAUGE—The Bristol Co. has published a 24-page bulletin, No. L700, describing instruments for measuring and recording water depth in reservoirs, elevated tanks, lakes, etc. Application data, information on remote recording and remote automatic pump control, photographs and drawings supplement the technical information in the bulletin.

46 WATER METERS—Neptune Meter Co. has released Bulletin 562, describing and illustrating auto-stop water meters, which, it is said, automatically control the amount of water delivered to ready-mixed concrete batches. Covering 1-, 1½- and 2-in. meters for cold, warm or hot water, this bulletin gives complete specifications and prices.

47 WELDING TORCHES — Air Reduction Co., Division of Air Reduction Co., Inc., has released a catalog on hand torches for gas welding and cutting, describing and illustrating the company's complete line of welding and cutting torches, outfits, tips and accessories. Featured are cutaway views and charts for correlation of the component parts.

48 WIRE ROPE—John A. Roebling's Sons Co. has issued a catalog, No. A-913, describing wire rope for excavating equipment with line drawings of various machines and the use of the rope for each. A list of recommendations for specified usages is published in the same piece of literature.

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(4-51)

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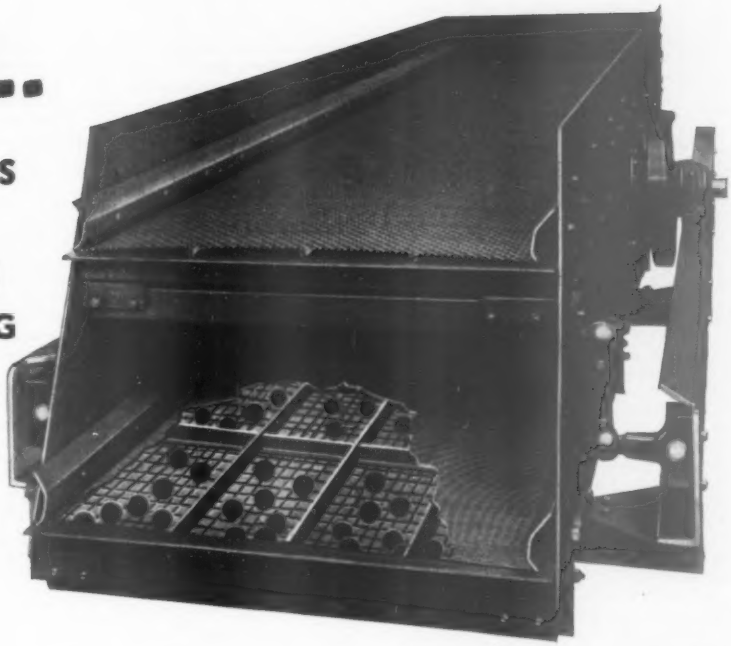

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One of America's Leading Makes of Vibrating Screens Exclusively.

(Continued from page 130)

Minn., asked if choke feeding a cone crusher would help eliminate long particles and the speaker answered in the affirmative. E. K. Davison asked what the metal wear on a rod mill would be for each ton of sand produced and Mr. Bond answered that it would be 0.25 to 0.50 lb. per ton. In the case of roll crushers the figure would be about the same because of the "total metal discarded" factor.

Franklin K. Wills, Warner Co., Philadelphia, Penn., asked if r.p.m. of a rod mill was increased with feed held constant, would more fines be produced? The speaker indicated that within limits, more fines would be produced as input increased.

Sand Preparation

"Sand Preparation" was the subject of a talk by Frank Penepacker, Pacific Building Materials Co., Portland, Ore., presented at the N.S.G.A. meeting for operators of sand and gravel plants. A motion picture showed all phases of production at the plant built in 1946 at Portland but emphasis was on sand production using Dorr classification equipment, including Dorr sizers, which are hindered settling classifiers. There are nine such operations in the sand and gravel industry at present of which there are six commercial plants. Some 77 installations are in the processing of phosphate and iron ore.

Mr. Penepacker referred to an article on the process which was published in the July, 1940, issue of ROCK PRODUCTS as the first time it came to his attention.

The process consists of introducing minus ¼-in. sand from the gravel screens into a 20-ft. hydroseparator with sufficient settling area to separate the dirty wash water and minus 150-mesh material which is collected in a launder. The settled product, which is the sand, discharges into two eight-compartment sizers where clean water is introduced to effect the separation. Sand is classified in each of the eight compartments due to the difference between their specific gravities. The smallest or lightest particles overflow the respective weirs from each sizer compartment into the next which results in making eight distinct separations regulated through automatic discharge. At this operation the discharge of the eight compartments is grouped into three sizes, ¼ in. to 14 mesh, 14 mesh to 30 mesh, and 30 mesh to 150 mesh. The result is a combined product that can be held very closely to a determined fineness modulus.

The pictures showed the entire layout which includes a gravel plant, lime putty and mortar mixing plant and central mixing concrete plant, located on the Willamette River in Portland. A clamshell Whirley feeds the plant from scows in the river. Two dredges are used to supply sand and gravel to two plants. Material is fed over the first screen at 200 t.p.h. where plus 1½-in. gravel is rejected to a reduction crusher. Four crushers are used in all. The ⅜- to ¼-in. pea gravel is separated from concrete gravel as a control of the amount occurring in the finished sizes.

Getting back to the sand processing, the feed to the sizers is about 50 percent solids. As long as the feed is uniform, the product of each compartment is held within a range of size and discharge is continuous. Water is supplied the two sizers at 1200 g.p.m. and the operation is geared to receive 80 tons of feed per hour. A double spiral screw dewaters the 30- to 150-mesh sand fed from the last three compartments and sand drags handle the discharge from the other compartments.

In the discussion following presentation of the paper, it was brought out that sand is produced usually to a 2.6 F.M. and that merchandising is done on the basis of F.M., which is consistently held within a maximum variation of ± 0.5 percent. There has been very little maintenance expense over five years and one man well versed in operation of this equipment is required.

Trash Removal

Speaking for T. E. Rust, Concrete Materials Co., Waterloo, Iowa, W. W. Roberts of the same company read a short paper on the use of the Holloway Hydro Separator at the company's Eddyville, Iowa, plant. This device, which was designed to remove lightweight particles and trash from gravel, was invented and patented by H. H. Holloway of the Holloway Gravel Co., Inc., Amite, La., a number of years ago.

It is designed for use in a pumping operation and is an extremely simple unit consisting of a shell, cone and hood assembled in such a way that centrifugal force effects a separation of light, undesired particles. The shell is normally the same size as the one on the primary dredge pump and is placed in a horizontal position and bolted to the discharge end of the pipe line, reversing the normal position of the shell so that the outlet serves as the inlet. The cone is secured to the lower side of the shell and the hood to the top side.

When the mixture of sand, gravel and water starts moving through the pipe line from the primary pump and reaches the separator, the shell tends to rotate the mass which descends into the cone area where the sloping surface of the cone causes a layer of water to rise on the inner surface of the hood. The forces in the rising layer of water are sufficient to carry materials with low specific gravity, such being fine sand or deleterious substances. Heavier particles continue to descend until they drop out through the opening in the bottom of the cone.

Slope of the cone governs the amount of overflow and may be varied according to any demand. Fine sand is recovered by placing a screen in the bottom of the discharge flume, and then is dewatered by a sand drag or screw washer. The shell has renewable manganese steel liners.

The unit has been operated at Eddyville for a number of years with very satisfactory results. Cost of operating a 16-in. unit is about ½ cent per ton.

Industrial Controls Forum

ONE OF THE MOST interesting joint sessions for both associations was one conducted as an open forum on industrial controls under the defense program. Executive secretary V. P. Ahearn, legal counsel C. A. Horsky and assistant to the executive secretary Kenneth E. Tobin were the discussion leaders. Many important questions were considered with respect to priorities, operating supplies, construction curtailment, defense construction requirements, wage and price controls and manpower.

Presiding officer A. R. Shiely started the session off by saying that there are enough big businessmen active in emergency capacities so that the conduct of controls will not be purely political, and he expressed the hope that industry will help the authorities to carry out the program.

In opening the discussion on priorities and allocation of equipment and supplies, V. P. Ahearn covered a number of informative points that have been unchanged by issuance since of Regulation 4 of NPA. Regulation 4, as interpreted elsewhere in this issue, gives privileges to both industries which were unavailable for comment at New Orleans.

The sand and gravel industry comes under the Defense Minerals Administration (Interior) whereas the ready-mixed concrete industry is under the jurisdiction of the Construction Materials Division of NPA, which permits the extension of ratings for cement, aggregates, admixtures and other materials essential to the production of concrete. The sand and gravel industry is considered as an industrial, or manufacturing, industry.

Mr. Ahearn believes the two industries will get along satisfactorily with respect to MRO items but there will be hardship in acquiring capital equipment. For the next two years he expects conditions to be more adverse, in that respect, than they were during World War II.

In the question and answer period that followed his introductory remarks, it was brought up that the shortage of reinforcing steel for con-

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- **Rugged Oliver power that puts more "push" behind the blade.**
- **Oliver exclusive steering principle that always lets you travel a straight line, regardless of the side-pull of off-center loads. No "jackknifing."**
- **Cable power control unit that assures constant operating speed for quick, accurate control of moldboard action. Available in front or rear mounted units.**
- **No operator fatigue. "Air steering," an optional Oliver feature, lets the operator control the tractor with just 2 fingers of one hand. No "footwork" required. Finger-tip dozer control unit on operator's right makes dozer operation easy. Operator faces forward in a natural, non-tiring position. Excellent visibility.**

Check these and the many other advantages of Oliver Crawler Tractors and Heil Cable Dozers with your Oliver Industrial Distributor. He'll show you why you'll profit with the "big push."

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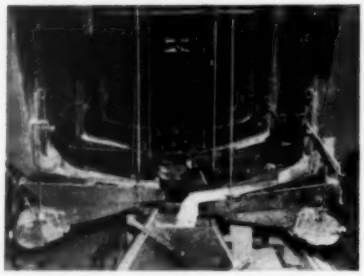

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Syntron Vibratory Feeders handle most all bulk material — fine, lumpy, hot, cold, damp, abrasive. They are equipped with a variety of troughs for many different operations in processing materials. The finger-tip control of flow, standard on all models, not only speeds up the operation but cuts down material waste. There is a variety of styles available for feeding various materials to crushers, grinders, driers, furnaces, mixers, onto belts, etc.

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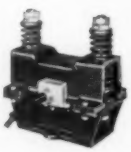
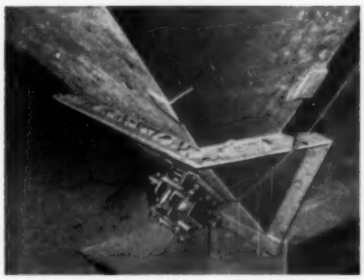


Model V-55 Vibrator on a Bulk Cement Hopper



3600 controllable vibrations per minute break down arching and plugging of even the most stubborn materials and keep your bins, hoppers, chutes and screens . . . of any size . . . flowing freely. There is no need for hammering, rodding and poking, that wastes costly manpower and steals valuable time from all dependent operations. Syntron Electric Vibrators are available in 8 different sizes — from a little 4 lb. model up to a big 700 lb. model — with a complete line of semi-noiseless models.

WRITE FOR CATALOG DATA

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crete might well nullify all the other concessions that might be gained. As to capital equipment including trucks, Mr. Ahearn said that a separate application must be made. An important point brought out was that capital equipment can be shipped to a producer if the manufacturer will do it.

As far as priority regulations might be effective in obtaining cement, Mr. Ahearn said that the rating takes precedence over non-priority orders but really amounts to a hunting license in fact. In answer to another question as to whether the Army can seize the production from a particular plant, he said that the Defense Department can get that authority from NPA if the move would serve the war program. Equipment would of course be readily available in such an event.

L. W. Dunn, Fort Worth Sand & Gravel Co., Inc., Fort Worth, Texas, center, receiving a trophy from Robert Mitchell

Mr. Ahearn said that everything in the way of needed materials will be short in supply for at least two years, but that it is hoped by officials that there possibly might be a return to near normalcy by the end of 1952. Conditions worse than during the past war are expected through 1952 because of the need to build cargo ships for ore transport and a navy, to supply our allies with equipment, to build stockpiles of critical materials, all while building up our own war potential. Steel is expected to be particularly critical, to the point of threatening the survival of individual businesses. Full effects of restrictions will be felt late in 1951 and even more so through 1952. The problem is one of survival for the next 14 to 18 months.

There is evidence already of black market operations in steel in some areas. Black marketeers are to be strenuously prosecuted.

The curtailment of construction in certain non-essential categories and required licensing were next discussed. Licenses for certain classes of construction, costing more than $5000, are expected to be difficult to obtain because of the steel shortage. It is the opinion among Washington leaders that little construction for defense needs will be necessary for this emergency program. As to the legality

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One-third the thickness of this page—that's the accuracy tolerance we insist on for wire that goes into the making of Wickwire Rope. Wire that doesn't meet this close tolerance is rejected. On finer sizes of Wickwire rope wire, tolerances are even closer, amounting to about one-sixth the thickness of this page.

Such unrivalled precision control over the uniformity of rope wire diameter is not apparent to the naked eye, but *how* it does show up in the superior rope performance and dollar savings you get with Wickwire Rope. Numerous other exacting tests, coupled with the know-how of 52 years experience, explain why Wickwire Rope gives you the utmost in uniformly dependable performance ...longer, more economical service on the job.

Wickwire Rope is available in all sizes and constructions, both regular lay and Wisscolay Preformed. See your nearest Wickwire distributor for the *right* rope for your particular needs. For your free copy of "Know Your Ropes," write to Wire Rope Sales Office, Wickwire Spencer Steel Division of C. F. & I., Palmer, Mass.

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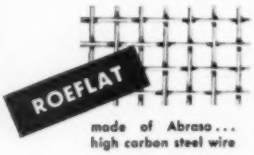

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available in stainless steel, monel and other alloys

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of a construction project, Mr. Ahearn does not believe it the responsibility of a producer of concrete or aggregates to investigate. However, if the job in question is a dance hall or other prohibited project, he said that producers should refuse to sell it.

There was much discussion as to whether or not building of a sand and gravel plant would be governed by restrictive measures affecting construction and there was divergence of opinion as to whether or not licensing would be necessary.

The point was later cleared up by Mr. Ahearn in executive letter No. 619 mailed February 26 to the membership. In that letter he pointed out that the amended M-4 Construction Order of the NPA does *not* require NPA authorization for producers to proceed immediately with needed construction which requires no NPA authorization.

The outlook for highway construction depends largely upon availability of steel and the threat to the highway program was emphasized by NPA's recent stand that steel would not be available to finish the New York Thruway, from New York City to Albany. Governor Dewey had approached Charles Wilson and got that answer.

With respect to suppliers who might be black market operators, it was brought out that honesty should be assumed unless it be strongly suspected that the supplier is engaged in illegal practices.

At the outset of discussion of wage and price controls, Walter H. Acheson, who will be in charge of controls for these industries, was introduced. Mr. Acheson has since gone to Washington where he heads up the Masonry Materials Section.

Mr. Ahearn then outlined the main points that govern in the Price Control Order which restricts prices to the highest price applied for the base period December 19, 1950, through January 25, 1951, for customers of the same class. The important point is that the order means the highest price charged for a product *delivered* during the base period. If there were no deliveries during the base period, the highest price offered would apply even though it might be different than the published list.

If there is no delivery or selling price, procedure is set up to fix the price in relation to prices for similar products delivered during the base period. In the case of a new commodity, a price must be developed for it and the product cannot be sold until ten days after posting it with OPS, to permit opportunity for disapproval.

No reports of prices need be given OPS, but suppliers must maintain records. Reports are required in cases of new products. While there is no provision established yet for hardship cases, such a setup likely will be made. In reply to a question as to whether or not increased costs of transportation or for tires, etc., may be added to prices, the answer was "no" unless approval is obtained. Increased costs must be absorbed, without specific approval to the contrary, where delivered prices are charged. Similarly, ready-mixed concrete producers must absorb increased costs for cement, aggregates and other incoming supplies.

Robert Mitchell, Consolidated Rock Products Co., Los Angeles, Calif., left, presents a ROCK PRODUCTS safety trophy to Franklin K. Wills, Warner Co., Philadelphia, Penn.

If a practice of granting discounts applied, the practice must be continued. In the case of a contract with a city, say for a year, the price must be held and bids cannot be higher. If no deliveries were made during the base period, the opinion was that the producer is fortunate because list prices are usually higher than delivered prices. Where a company operates several plants, each plant's history controls. Where a producer has a stationary plant and considers using a portable plant closer to the job, the higher price charged from the more remote plant will not apply. A new price must be established. Opinion is that the same decision would be made if a portable plant was moved in to complete a job.

One producer asked whether or not a higher price charged for heating of the concrete or the addition of $CaCl_2$ during winter months might not be the established maximum price to prevail. Mr. Ahearn believed that that would be permitted but the point was controversial. Mr. Horsky believes that if the extra charge is a separate item as a plus added to the standard price, that that added charge will not be permitted year-around. If a producer is entering the ready-mixed concrete business after the effective date of the price order, a ceiling price will be established equal to that of his closest competitor as applied to the same class of purchasers.

Mr. Horsky led the discussion on wage controls. He first touched upon the recent relaxing of the regulations. For one thing, if an increase was agreed upon before February 9, and there is a written memorandum to that effect, a report may be filed with

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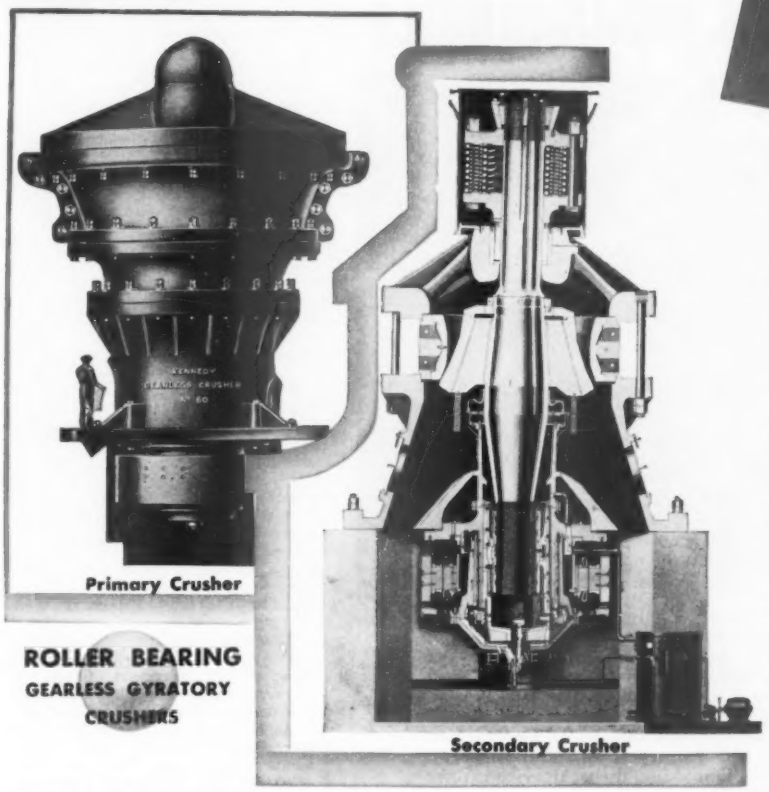

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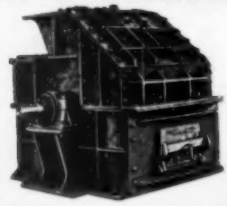
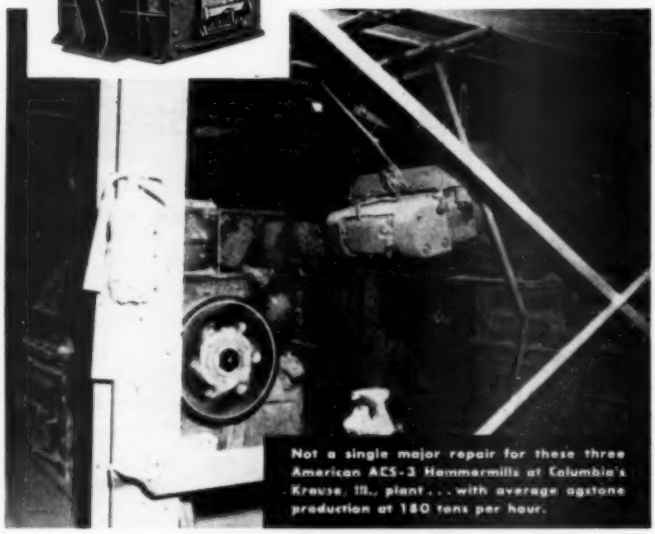


AMERICAN HAMMERMILLS



Not a single major repair for these three American ACS-3 Hammermills at Columbia's Krause, Ill., plant . . . with average agstone production at 180 tons per hour.

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Since their installation, *not one major repair* has been necessary on these Americans — in fact, no attention at all, except for the routine refacing of hammers and grate bars.

Nothing on the market today can equal these rock-hungry American ACS-3's for capacity, durability, or low cost of operation. Get all the extra-profit facts today. Write for free Bulletin "Better Stone Crushing."

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the Wage Stabilization Board for approval of the increase.

Merit increases based upon service and increases because of promotions and changed job conditions are permitted. Premium benefits may also be granted such as insurance, etc., but cost of living increases cannot be granted. Merit increases cannot be given to all employes but must be handled on an individual basis. An employer must bargain with his employes, even under wage controls, if the employes desire.

Mr. Ahearn said that while there are no regulations governing transportation that the industries likely will be given consideration. His executive letter No. 617 mailed to the membership February 16 gave the outlook for railroad cars, reproducing a special letter on the subject from W. E. Callahan of the Association of American Railroads. In this letter it was predicted that loadings of aggregates would increase 6.2 percent during the first quarter of 1951 as compared to a year ago. During 1950 there was a reduction of 16,700 hoppers and 12,000 gondolas due to the fact that retirements exceeded car replacements. As of January 1, 1951, there were nearly 100,000 more freight cars on order than was true a year ago, including gains of about 18,000 hoppers and 25,000 gondolas. Sufficient steel has been allocated to reach a monthly production of about 10,000 cars starting in April or May of this year. Taking into account retirements, the gain in hopper cars should be about 500 each month after April and the monthly gain in gondolas should be 900 cars.

Mr. Callahan requested support in the prompt release of equipment and in accelerating the countrywide effort to turn out clean cars. Cars must continue to be loaded to full carrying capacity.

Kenneth Tobin discussed military requirements for manpower and the prospects for deferment of essential workers. About the middle of 1951, guardsmen and reservists are expected to be called up for service and he warned producers to prepare replacements for such men. There is a form, AGO 591, for requesting deferment, available only to reservists, which reservists should be asked to execute for presentation to the area commander in each case. If deferments should be turned down in such cases, the association is prepared to follow through in behalf of member companies. Such deferments are only good for a year at most and usually for six months.

The sand and gravel and ready-mixed concrete industries are on the essential list and, as such, probably can get deferments for engineers, tugboat captains, and machinists and foremen if they are technical men. The best way to keep reservists and guardsmen, according to Mr. Tobin, is to secure deferment for more than four dependents.

As far as selective service goes, the

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thing to do is go into the matter of deferments before men are classified. Draft boards can deny a voice if the men have already been classified. It is expected that young fathers will be called up and that industry will have less voice as time goes on. There is little indication now that men over the present draft age of 25 will be taken. As far as sons are concerned, the only out for scholastic deferments is for students who are members of the R.O.T.C.

Taxation and Cost Accounting

The open forum on taxation and cost accounting, presided over by John W. Murphy, covered eight topics: (1) prospects for higher taxes in 1951, (2) certification of new plant construction for accelerated amortization, (3) renegotiation, (4) percentage depletion, (5) new excess profits tax law, (6) depreciation practices for plants and equipment, (7) costs and cost practices, and (8) possibility of new excise taxes.

Discussion began with mention of the 3 percent tax on property for hire. This tax yields more revenue than the amusement or gasoline taxes, it was said, and therefore is not likely to be rescinded. Most producers present wanted information on who pays the tax and who collects it. It does not depend on interstate shipments. Examples of the peculiar application of the law were given. If a producer tells a stripping contractor working his deposit where to dump the overburden, he is subject to tax for hire. If dumping is left to the contractor's selection, no tax is due. In the example of operation of ready-mixed concrete trucks, if both truck and driver are leased, the tax is due. Again, if lessee uses his own driver, no tax is required.

In many instances the 3 percent tax is not being paid. No tax is required if drivers are employes, but then other requirements have to be met, such as social security, compensation, insurance, other taxes, etc. It was suggested that a careful study be made if company truck drivers are not on the payroll, to determine if the tax applies and whether it is collected and paid by someone. Charles Horsky, association counsel and member of the panel, said that an employe may be a contractor in the eyes of the N.L.R.B. or Wage-Hour Administration, and an employe to the Bureau of Internal Revenue or Interstate Commerce Commission. There is no correlation among agencies, he said; thus each statute has to be dealt with separately. Mr. Ahearn, also a panel member, said he thinks the producer is responsible for collecting and paying the tax. Mr. Murphy gave the benefit of his experience, in which he said he made an agreement with the B.I.R. to give a quarterly list of customers to whom the tax was paid.

The practice of not itemizing bills for any tax paid is very bad, it was said. In the absence of a favorable ruling from the B.I.R., it is best to collect the tax. Every industry that uses owner drivers has this problem but the tax is only on cost of transportation for hire. Material sold f.o.b. plant frees the producer from any worry about the tax, since title passes at the plant.

A number of questions were asked about the tax application. If a purchaser of aggregate from a producer receives the delivery by contract hauler, the purchaser is not liable for payment of the tax. A ready-mixed concrete operator who owns the mixers and sells concrete to a trucker who owns the chassis and leases the mixer is subject to the tax. It was said, in answer to a question of whether the transportation tax can now be added to a bill in light of the price freeze, that this probably wouldn't be legal, if none was charged for during the base period.

Brief mention was made of the recent law permitting accelerated amortization of emergency facilities certified by the government as necessary. As short a time as five years may be allowed. The procedure for certification is complicated, and so far no sand and gravel or ready-mixed concrete producer has qualified.

During World War II the sand and gravel industry was mandatorily exempted from renegotiation, Mr.

forged STEEL DROP BALLS

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DeHart Pulverizer handles both quarry-run and over-size returns.

Look at the record of this 32 x 36 Lippmann Pulverizer at DeHart's Excelsior Springs quarry. Fed pit-run rock, from dust to 32 in., it produces 120 tons per hour "every hour of the day" of ag-lime "100% passing 8-mesh" without using all the horsepower the engine is rated to develop. After producing over 10,000 tons, DeHart has not even changed the hammer wearing surfaces.

Not only for ag-lime, but for road material, manufactured sand, coal or any friable material, there's not a machine made that can touch the Lippmann Pulverizer for high capacity, uniform cubical product, low maintenance and low first cost. Write for Bulletin 1160.

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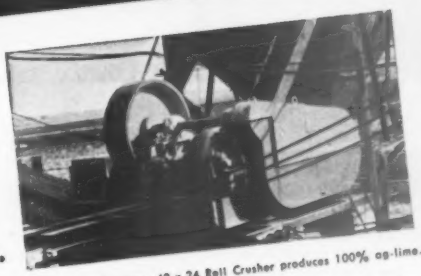
says P. A. Bradbury, Aberdeen, S. D.



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And their letter continues, "Send us another 24 x 16 Roll Crusher *exactly* like the one we purchased Nov. 20, 1946." No wonder Bradbury Construction Co. wanted an exact duplicate of their Lippmann Roll Crusher — "In less than three years' operation, we produced 548,783 cu. yds. of gravel from hard rock . . . without any mechanical repairs. In fact, the rolls have never been taken apart, and only required building up the faces 6 times."

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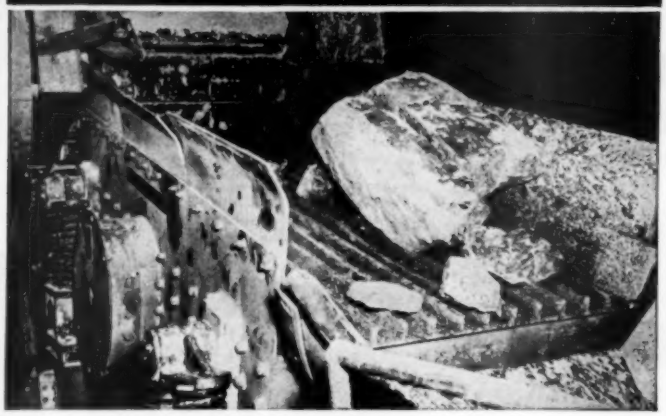

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Ahearn said. The ready-mixed concrete industry was finally exempted on the grounds it was producing the same product as sold in peacetime. A recent law has passed the House, reinstating the wartime renegotiation law. This law is not as specific as is desired, according to Mr. Ahearn.

J. Rutledge Hill, chairman of the association committee attempting to obtain percentage depletion for the sand and gravel industry, described his efforts. The House Ways and Means Committee (principal taxing policy body) realizes the rapid depletion of gravel resources and that the sand and gravel industry should have percentage depletion as much as vermiculite, gas, oil, lumber and the others. The outbreak of war in Korea killed a favorable House bill, however. Mr. Hill demonstrated the savings that would result from percentage depletion: if a producer were to sell $1,000,000 of sand and gravel per year, and there was a 15 percent depletion allowance, he would be able to keep $150,000 tax free if the profit were $300,000.

Provisions of the new excess profits tax law were described. A copy of the law was mailed to all association members. It was said that the law will help smaller corporations. There are hardship case provisions for strikes, fires, floods, a growing or new corporation. Directly applicable to sand and gravel production is an excess production provision; if output exceeds base period output, there is also a special provision. Mr. Hill discussed the logic behind the appeal and successful repeal of the separate deposit taxing.

Cost Practices

L. M. McCandless, Turner Gravel Co., San Antonio, Texas, described his company's system of trucking in the ready-mixed concrete industry. He felt it is best to talk about record keeping and not cost accounting. Since he had to keep records to comply with state and federal laws, it was no trouble to set up a method for determining cost of each delivery. His profit and loss statement is very condensed, he said. Detailed cost analyses are prepared—cost of materials, delivery expense, batching expense, overhead, etc. Cumulative records are kept. A record of each mixer's operation is kept, providing the means to investigate why some units make money and some lose money. Statistical reports are set up so the current month statement can be added to the cumulative, Mr. McCandless said.

A number of polls were taken to determine the depreciation practices followed by members in the audience. A tabulation follows (percentages approximate).

Do you depreciate trucks and mixers at the same rate? About one-third of the audience did at the same rate, two-thirds at a different rate.

Time period for depreciating trucks:
Less than 5 years.....30 percent

Five years .....60 percent
Six years ..... 9 percent
Seven years ..... 1 percent
More .....None

Time period for depreciating mixers:

Less than 5 years.....20 percent
Five years .....45 percent
Six years .....15 percent
Seven years ..... 5 percent
Eight years .....10 percent
More than 8 years .... 5 percent

Depreciating steel batching plants (plant itself, and not the machinery):

Less than 5 years..... 0
Five to seven years.... 0
Eight years ..... 1 percent
Nine years 0
Ten years .....90 percent
Fifteen years ..... 9 percent

Batching equipment:

Five years or less..... 5 percent
Six years 0
Seven years ..... 5 percent
Eight years .....10 percent
Nine years 0
Ten years .....80 percent

The final discussion under this topic centered around reconciling cement losses in batching. Mr. Murphy said that he tallys cement used and what should have been used in the morning following each day's operation. He then reconciles losses at the end of the month. Mr. McCandless said that his company's physical inventory gives results within 300 bbl. of what was used. One producer said that he had received some cement hopper cars having an incorrect empty weight stenciled on them. Re-weighing showed 2000-3000 lb. not received.

Concrete Clinic

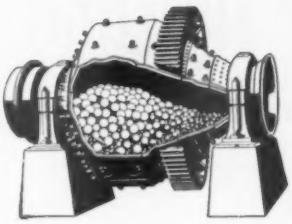
A "Clinic on Calculating Concrete Proportions" was conducted by Stanton Walker, director of engineering, assisted by Delmar L. Bloem, assistant director of engineering of the two associations. This session supplemented the instructions given by the two associations at the University of Maryland at the annual short course for industry technicians. The meeting was very well attended.

The clinic on calculations relating to concrete was carried out in the usual manner whereby each in attendance was given a mimeographed pamphlet containing a series of problems relating to concrete proportioning. The printed matter also included solutions of the problems. At the session a few of the problems were selected and were worked out on the blackboard, and explained by Mr. Walker.

The session also brought out some floor discussions relating to concrete, especially air-entrained concrete and Mr. Walker said the use of air offered great opportunities for border-line sands but for coarse aggregates of similar types the evidence was contradictory. Air, it was explained, increased the durability of concrete as the space occupied by air bubbles allows room for ice in the concrete to expand. In the Pacific Coast areas

If your problem is

GRINDING



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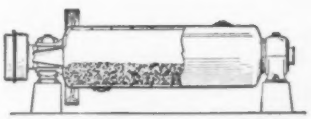
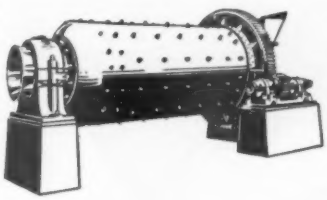


• TUBE MILLS

For a fine product in open circuit without the use of classifiers. For mixing and grinding to secure a smooth texture or plastic product. Bulletin 18-A-7.



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the only device of its kind that controls the feed rate in grinding mills by listening to the sound of the rotating load. It compensates for changes in hardness, size of feed, etc.—producing a more uniform oversize, increasing mill capacity 10 to 20%, and freeing the operator for other duties. Ask for bulletin 42-7.

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All of these things are possible because of the new, unitized head-motion and the super-strong but light weight aerodynamic type of construction.

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where freezing is not a problem, air-entrained concrete is desirable because it has better workability, it bleeds less, and has greater resistance to alkali waters. Air-entrained concrete should stand sun changes better although little work has been done on this, it was explained.

The session also developed the statement that the use of dump trucks for transportation of ready-mixed concrete need not be of serious concern to the manufacturers of mixer bodies.

One member from the floor said that use of air-entrained concrete on finishing courses caused scaling and in reply it was suggested, in such cases, not to use air entrainment.

One member asked what effect hard water would have on air-entrained concrete and Mr. Walker hazarded a guess that hardness (or softness) of water would not affect concrete one way or another.

Employe Relations

The topic of Wednesday afternoon's open forum was employe relations and related federal statutes. Norman J. Fredericks presided, and V. P. Ahearn, Kenneth Tobin and Charles Horsky of the association gave the background of the laws and problems that were discussed.

Mr. Tobin gave results of a survey made to determine what fringe benefits (e.g., insurance, pensions, hospitalization, etc.) sand and gravel and ready-mixed concrete companies are offering their employes. The survey showed that these benefits have not made great inroads in the industries. No more than a half dozen of 143 companies replying had pension plans. Most benefits are not covered by union agreements, it was discovered. A number of tables have been prepared based on survey data, which Mr. Tobin said would be made available to association members.

The survey indicated that there is no industry-wide plan for payments of group hospitalization—some pay all premiums, whereas others pay only part, the employe paying the balance. The average maximum of insurance coverage per man is $2000-$2500.

The opinion of most N.R.M.C.A. members is that group hospitalization or group insurance is a good thing. The board of directors has taken the position that a plan for such should be offered members if they want it. It will be up to employes and employers to decide the cost split. A questionnaire to determine members' reactions to the plan drew an amazing percentage of returns, according to Mr. Ahearn, most answers being favorable. Those not interested in an association plan for the most part have their own plan, he said.

Mr. Ahearn, in commenting on pensions, said that employers must negotiate with the union on pensions if the union brings it up. However, a pension plan cannot be instituted without the permission of the Wage Stabilization Board. There is the possi-

bility of overtime charges being required under the Wage-Hour Act if pension funds are added, he said. The Taft-Hartley Act prohibits employers from paying any pension funds to unions, the exception being if payment is into a trust fund in which each employe knows his equity.

Mr. Ahearn discussed labor negotiations and contracts at some length. Some of the highlights are presented here. Industry is making a slow but steady recapture of managerial authority since the advent of Taft-Hartley. Among the T.-H. provisions aiding this are the outlawing of the closed shop. Also, he said, the business agent of a union now has to consult an employer before going around the plant, with the option understood of the employer accompanying him.

The speaker gave suggestions on the writing of contracts. No employer loses anything if he takes a firm stand in negotiating, he said. A very good method of communicating company policies to employes was suggested: write a letter from the president on company stationery giving business news of interest to the employe and send it to him at his home. This will inform him and recognize his dignity in the eyes of his family—an important morale factor. Some association members are doing an outstanding job of this, Mr. Ahearn commented.

A discussion of union representation began when a member asked if an employer can bargain with a union if it isn't certified. Mr. Ahearn answered that a contract cannot be agreed upon unless the workers vote that the union represents them. Even if the union is certified this vote must be taken. The only thing unions have any right to demand is to be recognized as the exclusive bargaining agent. The speaker commented that he felt the demand for a union shop is an admission of union weakness.

Certification that a union represents all employes is not necessary for a company to recognize the union, Mr. Ahearn said. A contract can be signed which is invalid if an election proves the union does not represent all employes. Briefly discussed next were seniority provisions in contracts, which in the strictest sense were said only to require rehiring men when laid off according to seniority. Advances are being made in the provisions in recent contracts, he said.

Mr. Horsky provided the information on recent changes and applications of federal laws. The latest interpretations by the Wage-Hour Act administrator are limited in jurisdiction since Congress amended the act. Now only producers actually crossing state lines are affected. However, the administrator so far has refused to change the past procedure. Many absurd rulings have been eliminated recently, so the act should not give much trouble now, the speaker said. Nevertheless, Mr. Horsky suggested that if any producers not now covered by the provisions are visited

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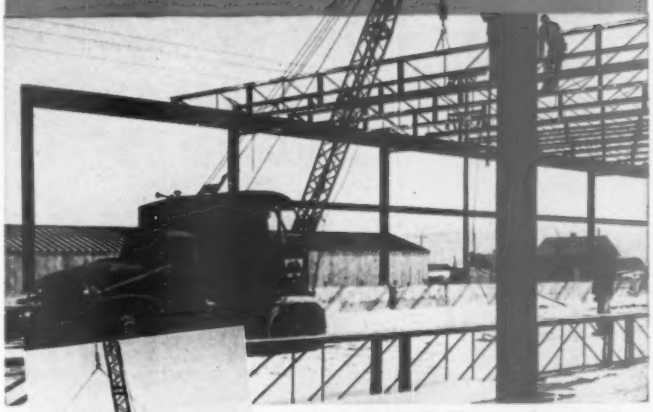

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by a Wage-Hour Act inspector, they should let the association office in Washington know how they were treated and what was decided.

A question was asked about what has happened to Taft's amendments to the Taft-Hartley Act. Mr. Horsky answered that these are bogged down in the House, though they passed the Senate. These would eliminate the union shop election, which is favored by employers since the union usually wins anyway. Mr. Ahearn commented that Senator Taft is probably letting others put up amendments to the T.-H. law.

Another question was asked whether drivers are subject to I.C.C. or Wage-Hour Act provisions. Mr. Horsky said that if the driver crosses state lines, he is subject to the Motor Carrier Act (which is concerned particularly with safety measures). This act has prevailed in courts. If the trucker is engaged in completing a stream of interstate commerce, he may still be subject to minimum wage anyway, but no overtime is required until after 60 hr. under the Motor Carrier Act.

Testing Aggregates

H. K. Cook, chief, Concrete Research Division, Waterways Experiment Station, U. S. Corps of Engineers, Jackson, Miss., reviewed procedures used by the Corps in testing concrete aggregates.

Mr. Cook said that the Corps had six other laboratories for testing aggregates. They are located at Mariemont, Ohio; Marietta, Ga.; Dallas, Texas; Omaha, Neb.; Sausalito, Calif. and Troutdale, Ore., and each has a division laboratory serving the general areas.

He called attention to the "Handbook for Concrete and Cement" that the Corps of Engineers had published and which is used by all the division laboratories. The book is a loose-leaf publication and many of the tests contained in it are reprints of A.S.T.M. data. The speaker pointed out that the laboratory does not decide whether an aggregate sample represents satisfactory or unsatisfactory material since factors other than quality enter into the picture, such as economics.

He said that the Corps of Engineers specifications for aggregates do not ordinarily include quantitative limits for any factor other than grading and uniformity of grading. Service records are also used in evaluating aggregates with respect to quality. In this regard, the speaker said: "All aggregates are tested for grading although, in the initial evaluation of an aggregate for acceptability as a source, it is more important that it be determined that the various sizes are present in sufficient amounts for economical processing than that they initially meet a specified grading. It is, of course, mandatory that the aggregate, when processed for use on the project, fall within the specified

grading and that the fineness modulus of the sand remain uniform . . ."

The speaker dwelt at some length on the test methods for determining grading, with emphasis on the handling of the finer sizes or what is usually referred to as the decantation test. In this regard, the speaker said: "We put a No. 200 sieve in the nest of sieves when determining sieve analysis for the purpose of improving the accuracy of the decantation test and as a check that all of the minus 200-mesh material is accounted for in the event it was not all washed out in the decantation test. In our calculations we add the weight of the minus 200-mesh material obtained in the decantation test to the weight of the sample for sieve analysis. We also add the weight of minus 200-mesh material obtained in the decantation test to the weight of material passing the 100-mesh sieve. We also add the material which passes the 200-mesh sieve and is retained on the pan, in the sieve analysis, to the weight of material passing the 100-mesh sieve."

The speaker said that specific gravity and absorption determinations were made as they indicated quality and that the Southwest District Laboratory had suggested a method for use on the 3-in. to 6-in. sizes. In this regard, the speaker said: "This method employs the use of a large air meter, such as is commonly used for the determination of the air content of mass concrete, as a pycnometer. The air meter is approximately 2.8 cu. ft. in volume. The air meter is filled to the zero mark with water and weighed. The weighed saturated surface-dry sample of aggregate is placed in the meter and the meter refilled with water to the zero point. Entrapped air is removed by tapping and rolling and the removal of the air is checked by applying pressure to the air meter. The air meter with its contents is then weighed. Specific gravity is calculated by dividing the weight of the sample by the weight of the air meter full of water, plus the weight of the sample, minus the weight of the air meter containing the sample and water. Absorption is determined by the usual calculation after determining the weight of the oven-dried sample."

The speaker said if an aggregate is suspected to be reactive that a quick chemical test, a mortar-bar test, and petrographic examinations are made. The chemical test is based on the aggregate's solubility in NaOH. The petrographic examination can quickly eliminate sources which are extremely weathered, soft, porous, mechanically weak, or contain reactive materials.

He said one of the main reasons for the existence of the laboratories was to save the government money and that in this regard pozzolanic materials, to save cement and to act as alkali aggregate inhibitors, were being studied.

The speaker told of the two expo-

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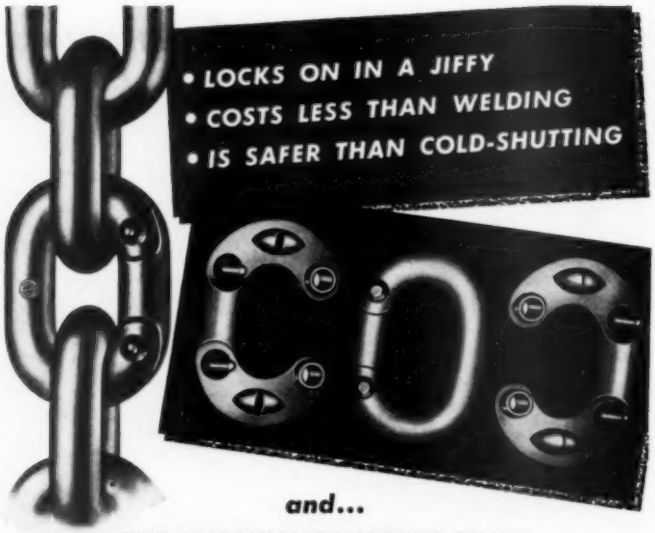

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sure stations, one at Treat Island, Maine, and the other at St. Augustine, Fla., where concrete specimens were subjected to severe weather conditions, and to sea water under non-freezing conditions.

In the use of the heavy media process as a means of determining sound and unsound materials, the speaker said:

"Since the major portion of the samples which we receive at our own laboratory come from the Gulf Coastal Plain, most of the gravel is chert. We therefore very frequently determine the percentage of porous or 'unsound' chert in the gravel. We do this by separating the gravel on the basis of specific gravity in a liquid having a specific gravity of 2.4. The porous or 'unsound' chert floats and the heavier materials sink."

Stream Pollution

A. H. Smith, president, A. H. Smith Sand & Gravel Co., Branchville, Md., told of his experiences that resulted from a decision by a Maryland Court which prevented him from introducing waste materials into a navigable stream.

He told of being in business 27 years and that he was suddenly given notice that he was polluting a stream. Then he was brought into court and fined $50 on a criminal charge, which he appealed and won a reversal. Later he was faced with a civil action and as a result had to revamp his operation, whereby he recaptured the finer sizes and used them in his asphalt plant. This involved a $40,000 expenditure including a triple-deck Tyler screen and two Woods classifiers.

The speaker sounded a warning to all producers who wash their material, because the trend is toward requiring a low solids content in fresh water streams. He said he could not get any experts to help him with his case and that the Maryland Courts said 400 parts per million, or close to it, would be acceptable, and that 10 parts per million was the ultimate goal for the Potomac River area.

Safety Awards

Following the election of officers, Mr. Mitchell, chairman of a session for sand and gravel producers, spoke a few words urging all members to take an active part in the safety programs. He pointed out that he had found that it paid big dividends to do so.

Next came the presentation of the cast stone trophies awarded the winners in the N.S.G.A. safety competition for 1949. For the first time three awards for three size classifications were made. The Class "A" trophy winner, for plants operating in excess of 100,000 man-hours without lost-time accidents, was the Van Sciver plant of the Warner Co., Philadelphia, Penn. Franklin K. Wills received the trophy on behalf of his company.

The Class "B" trophy, in the 50,001-

100,000 man-hours size range was the Talton plant of the Texas Construction Material Co., Houston, Texas. D. E. Baker, production manager of Texas Construction Material Co., received the plaque for the Talton plant.

The Class "C" trophy, for the winning plant that operated less than 50,000 man-hours, was won by the Fort Worth Sand and Gravel Co., Thomas plant, and the trophy was received by L. W. Dunn.

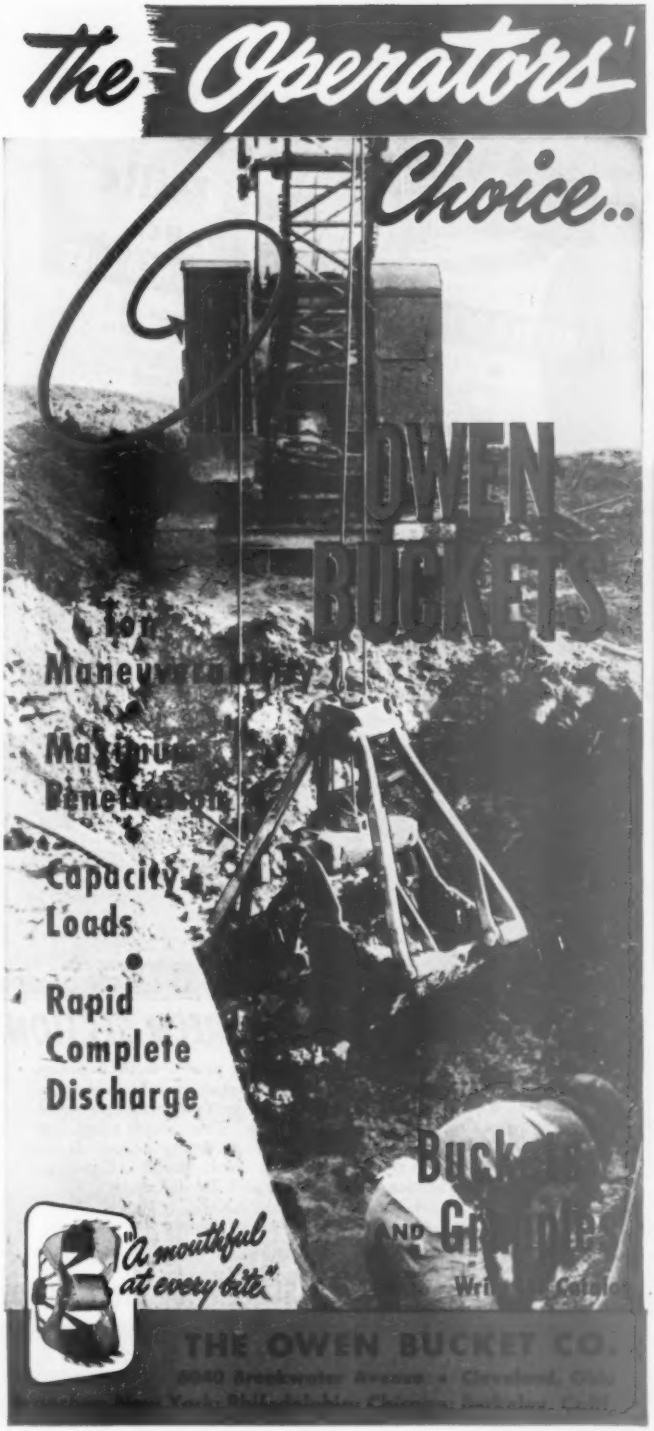
The three trophies were awarded for 1949 safety records in the National Sand and Gravel Association safety competition, for which statistical data are supplied by the United States Bureau of Mines. The trophies are of colored concrete with the picture of the winning plant reproduced in the concrete. ROCK PRODUCTS annually awards these trophies.

In addition to the three trophies, 17 plants were winners of certificates for outstanding safety records. They were as follows:

Texas Construction Material Co., Dolen plant, Houston, Texas
Dravo Corp., Keystone Division, South Side plant, Pittsburgh, Penn.
Consolidated Rock Products Co., Roscoe No. 2 plant, Los Angeles, Calif.
City Rock Co., Sunland plant, Sunland, Calif.
Gifford-Hill and Co., Inc., Hudson plant, Dallas, Texas
Concrete Materials Co., Eddyville plant, Waterloo, Iowa
Panhandle Gravel Co., Amarillo plant, Amarillo, Texas
Eastern Rock Products, Inc., Boonville plant, Utica, N. Y.
Pacific Coast Aggregates, Inc., Rockfield No. 124 plant, San Francisco, Calif.
Stewart Sand and Material Co., Kaw No. 2 plant, Kansas City, Mo.
Consolidated Rock Products Co., Claremont No. 11 plant, Los Angeles, Calif.
Texas Construction Material Co., Corrigan plant, Houston, Texas
Consolidated Rock Products Co., Sierra No. 19 plant, Los Angeles, Calif.
Pacific Coast Aggregates, Inc., Olympia No. 125 plant, San Francisco, Calif.
South Bend Sand and Gravel Corp., South Bend plant, South Bend, Ind.
Union Sand and Gravel Co., Yardley plant, Spokane, Wash.
Eastern Rock Products, Inc., Barneveld No. 2 plant, Utica, N. Y.

Manufacturers Division

Manufacturers Division, N.S.G.A., held two separate meetings, before and during the course of the conventions, in order to consider fully plans for the 1952 exposition scheduled for Chicago and expositions to be held in later years, and so that the Division might be informed of the desires of



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the associations as expressed in the two boards of directors meetings.

The Division emphatically expressed its desire to enlarge and improve future exhibits and many of its members were in favor of serious consideration being given to holding future expositions (after 1952) in cities with large exhibit facilities outside the convention hotel. The city of Cleveland with its large public auditorium was mentioned in particular. A committee was appointed to work with the associations in formulating a course of action; however, the Division expressed its desire to be guided by the decisions of the associations.

Resolutions were adopted thanking President Snyder of N.S.G.A. and President William Moore of N.R.M.-C.A. for their help and continued interest in the Manufacturers Division and expressing appreciation to chairman Morgan R. Butler and V. P. Ahearn. Another resolution of sympathy, in the death of C. B. Andrews, Taylor-Wharton Iron & Steel Co., was voted, with copies to be sent to Mrs. Andrews and the company, and a similar message was voted in the death of Bradley S. Carr, American Manganese Steel Div.

Ralph C. Johnson, Simplicity Engineering Co., Durand, Mich., was elected chairman of the Manufacturers Division to succeed Morgan R. Butler, Butler Bin Co., Waukesha, Wis. R. P. McKendrick, Blaw-Knox Div., Pittsburgh, Penn.; Richard D. Ketner, General Electric Co., Schenectady, N. Y.; E. M. Heuston, Bucyrus-Erie Co., South Milwaukee, Wis.; and L. C. Mosley, Marion Power Shovel Co., Marion, Ohio, are vice-chairmen. The board of directors, in addition to the officers, comprises D. McM. Blackburn, Hendrick Manufacturing Co., Carbondale, Penn.; C. B. Laird, Eagle Iron Works, Des Moines, Iowa; J. C. McLanahan, McLanahan & Stone Corp., Hollidaysburg, Penn.; W. A. Rundquist, Pioneer Engineering Works, Minneapolis, Minn.; E. D. Stearns, Barber-Greene Co., Aurora, Ill.; Jack Bond, Nordberg Manufacturing Co., Milwaukee, Wis.; and Roy Wills, Lima Shovel and Crane Division, Lima-Hamilton Corp., Lima, Ohio.

Joint Luncheon

DeLesseps S. Morrison, New Orleans' mayor, addressed the joint luncheon of the N.S.G.A. and N.R.M.C.A. He pointed out that it was not the city government but private business which led the expansion of industry and building in the city. In 1950, $92,000,000 worth of private building permits were issued, eight times normal, the mayor said. Included in this building activity were 7000 new homes.

Gold keys to the city and certificates of honorary citizenship were presented by the mayor to Mr. Snyder and Mr. Moore, presidents of the N.S.G.A. and N.R.M.C.A., respectively. Following the presentation, Mr. Morrison narrated a series of colored slides of New

Orleans, showing principally new public works and the Union Station relocation project. Great activity in these projects has taken place in the last year.

Entertainment

Mr. and Mrs. Paul F. Jahncke, Jr., and Mr. and Mrs. Herbert G. Jahncke were hosts to the boards of directors of both associations and their wives at the Jahncke estate near Covington, La., on Sunday, February 11. It was an all-day occasion and special buses were chartered for the round-trip.

The Jahncke estate proved to be a delightful spot and the weather was perfect, permitting the guests to engage in outside activities the entire day in a setting that will long be remembered. Refreshments were served, and a buffet dinner fit for a king climaxed the day's activities.

A special program was planned for the ladies during the convention. It started with a luncheon at New Orleans' famous Patio Royal in the French Quarter, which featured a talk on the traditions of the French Quarter. The following day, there was a walking tour of the Ante-Bellum Homes of the Garden District which concluded with a tea at the McGehee School.

Instead of the traditional reception, a night boatride around New Orleans harbor was arranged for all in attendance at the conventions. The *President*, a regulation excursion ship, was chartered for the evening and a name orchestra and floor show provided the entertainment.

Masonry Mortars and Units

AN IMPORTANT ACCOMPLISHMENT, as reported at the recent meeting of Committee C-12 of the American Society for Testing Materials on Mortars for Unit Masonry, in Cincinnati, Ohio, is the acceptance of a new specification for mortars for unit masonry, which will now go to letter ballot. This proposed specification is the result of ten years' study and effort.

These specifications cover mortars of four types for use in the construction of unit masonry structures. They include two alternate specifications as follows:

I. *Property specification* in which the acceptability of the mortar is based upon the properties of the ingredients (materials) and the properties (water retention and compressive strength) of samples of the mortar mixed and tested in the laboratory.

II. *Proportion specification* in which the acceptability of the mortar is based upon the properties of the ingredients (materials) and the proportions of these ingredients.

It is expected the existing Specification for Mortar for Reinforced Brick Masonry (C 161 T) will be discontinued when the new tentative specification is advanced to standard.

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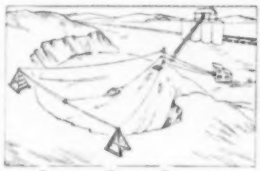
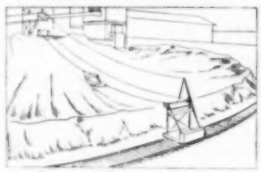


Sauerman Scraper Excavator



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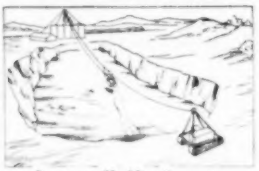
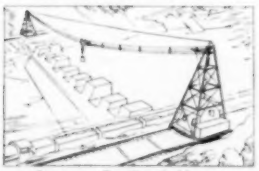


Sauerman Slackline Excavator



Sauerman Tautline Cableway

For more than forty years the main Sauerman business has been the designing and building of cable-operated excavators and conveyors that overcome the difficulties and reduce the costs of moving materials over large areas. Among the best known of these Sauerman machines are the following:

Drag Scraper Excavator — An economical machine for pit and hill excavation, rehandling industrial wastes, cleaning out ponds and general long range earthmoving. It is a powerful excavator and a rapid conveyor.

Drag Scraper Stockpiler — For bulk storage, Sauerman engineers have developed a series of drag scraper machines that make storing and reclaiming an easy one-man job. These machines are giving satisfaction in handling such diverse materials as coal, concrete aggregate, ore, salt, sugar, fertilizers, etc., both indoors and in the open.

Slackline Cableway Excavator — This unique machine has no equal for work that requires digging deep and far and conveying to a high delivery point. In a wet gravel pit, for instance, it reaches under water, comes up with a heaping load of gravel, and lifts its load to the top of the plant, delivering thirty to forty loads an hour.

Tautline Cableway — This is a long range aerial crane designed for all jobs of lifting, conveying and placing loads of unwieldy materials. It is used in quarries and open pit mines to lift and carry big chunks of stone and ore. It is standard equipment for contractors on concrete dam construction.

Other Sauerman Machines — Sauerman also builds Tower Excavators and Scraper-Loaders for work requiring machines that move along as they dig; also Power Rakes and Grapples for handling massive materials.

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Labor Relations Trends

(Continued from page 77)

mine operators. It ignores the fact that this one contract alone will appreciably increase the fuel and power costs of a multitude of other industries—a big item for example in the cost of making portland cement.

Other wage and salary increases authorized by the same Regulation No. 2 are: Increases resulting from awards or decisions of arbitrators and referees, issued on or prior to January 25, if effective not later than 15 days after said date; agreements for fixed pay-roll increases to accomplish interplant adjustments entered into prior to January 25, 1951. However, employers were required to furnish proof of such increases as mentioned in this and the preceding paragraph to the Wage Stabilization Board prior to February 20.

General Regulation No. 4 followed on January 31. It provides that "increases in wages, salaries and other compensation of state, county, municipal and other non-federal government employes * * * may be made without prior authorization of the Wage Stabilization Board." However, the Board reserves the right to revoke or modify such increases, but it is not likely that the salaries of politicians, big or little, will be interfered with. Since these salaries and expenses are paid by taxes, it is obvious that the cost of living and the cost of doing business will be increased by added local taxes.

General Regulation No. 5, issued February 2, provides for wage and salary increases without prior approval of the Wage Stabilization Board for "merit and/or length of service" in accordance with a plan in effect January 25, 1951. However, there must be proof that such a plan was in existence, and the nature of the planned increases must be detailed. In the absence of such a plan, it must be shown that the employes "shall not have received a merit or length of service increase during the 12 calendar months preceding the effective date of such increase." However, the number of employes whose rates are thus increased must not exceed the proportionate number of increases granted per month during the calendar year 1950 in each bargaining unit or other appropriate group of employes. Moreover the increase granted any employe must not exceed in amount the figure reached by dividing the total amount of merit and/or length of service increases granted to employes in the same job classification during the calendar year 1950. No employe shall be raised to a rate higher than the maximum for that job classification, or to a rate higher than paid to an employe doing the same kind of work on January 25, 1951.

Promotions are permitted if they conform to previous practice under a collective bargaining agreement or

under a written statement of policy or procedure to January 25, 1951. If there is no recorded practice the employer is allowed to follow the same practice as he followed in the calendar year 1950, but in no event may an employe thus promoted receive a rate in excess of the maximum of the rate range to which he is promoted or transferred. Rates for new or changed jobs must be fully justified, if they are increases. New employes can not be hired at rates exceeding the minimum of the rate range of the job classification, or the minimum rate paid to any employes doing similar work during the pay period immediately preceding January 25, 1951, if the establishment has no system of job classification. Present differences in pay rates because of normal incentive plans, change of shift, commission plans, overtime and penalty rates and "other similar auxiliary pay practices" are permissible.

Records of all such pay changes must be kept ready for inspection at any time by the Wage Stabilization Board, but not by union labor agents.

No Price Increases Here

Regulation No. 5, from which the foregoing was abstracted states: "Increases in wage rates of employes granted under the terms of this General Regulation shall not furnish a basis either to increase price ceilings or to resist otherwise justifiable reductions in price ceilings."

General Regulation No. 6, issued February 16, 1951, in addition to several other points, states in Sec. 6: "In rare and unusual cases where critical needs of essential civilian or defense production require it, the Wage Stabilization Board will consider the approval of increases in wages, salaries or other compensation greater in amount than specified in Sec. 2 [which states a policy of allowing general wage increases up to 10 percent since the base period—base pay period ending on or after January 15, 1950]. Such rare and unusual cases will be limited to those situations where there are serious manpower shortages and in which other governmental agencies concerned with production and manpower problems certify to the Board that a concerted program has been undertaken to remedy the shortages, and that an increase in wages, salaries and other compensation is indispensable to attract required labor to or retain it in essential civilian or defense industries or plants."

At this stage the union representatives on the Wage Stabilization Board walked out, presumably because the allowable 10 percent increase was to include the fringe items such as extra vacation pay, holiday pay, pension and welfare benefits, etc.

General Regulation No. 6 issued February 27 provides that regularly paid incentives, commissions and bonus payments, wage differentials for night shifts, etc., are included in the wage increase limitations.

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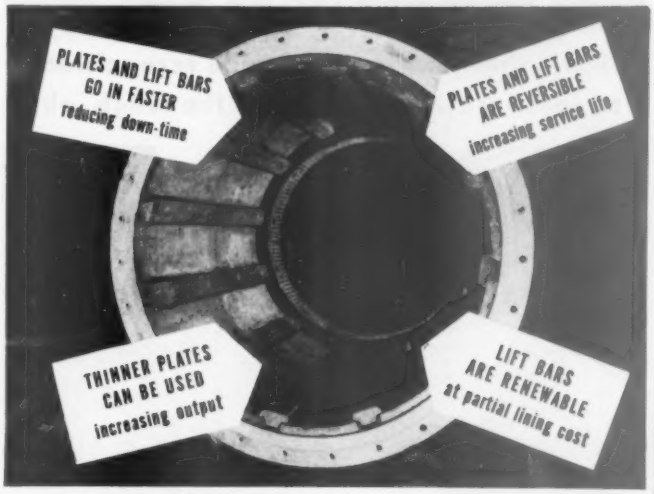
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General Regulation No. 8 issued March 1 provides that no prior approval is required for putting into effect wage and salary increases which are required by the terms of cost-of-living escalator clauses contained in contracts executed on or before January 25, 1951, but after January 25 general increases agreed upon, together with cost-of-living escalator clause increases, shall not exceed the 10 percent formula.

This was the first big concession, and obviously it assures another increase in the cost of living. But union labor leaders are still not satisfied, and at this writing continue to boycott the Wage Stabilization Board.

NPA Regulation 4

(Continued from page 95)

proportion to the amount spent while in operation, with reasonable adjustment for seasonal and other factors. New firms may acquire for MRO purposes the minimum amounts necessary for operation, up to $5000 quarterly. The fiscal year rather than the calendar year may be used in establishing quarterly quotas. MRO may be obtained without using the DO-97 rating, but if *any* use is made of this rating, the *total* MRO acquisitions, rated or unrated, are subject to quota limitations.

Regulation 4 is regarded in N.P.A. circles only as a "stop-gap." It will be supplemented by regulations dealing with the requirements of specific industries. Obviously, an MRO quota established on a dollar volume is inadequate as it makes no allowance for the substantial increase in the prices of MRO items compared with one year ago. If under these circumstances, it is found that the MRO quota is inadequate, then a special application should be filed.

Wins Zoning Appeal

ARROWHEAD SAND AND GRAVEL CO., Duluth, Minn., was recently granted a 3-year permit to operate gravel hoppers in a residential zone. The firm had been turned down on two previous proposed locations because of neighborhood objections.

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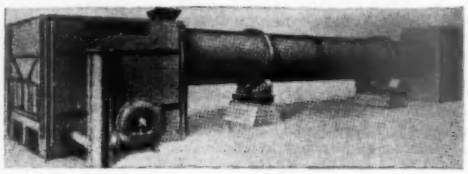

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Needs for Lime

(continued from page 99)

worms. Organic matter serves as food for earthworms. They eat their way through the soil, leaving air and drainage channels behind. Thus the soil's capacity for water intake is increased, as is the rate at which any excess will move downward to groundwater levels instead of running off the land.

It is a well-known fact that soils of limestone origin are naturally highly productive. The soil itself may contain no limestone, being made up merely of the impurities that the limestone contained. But there is always some free lime in their subsoils, and they are often underlain by thick deposits of limestone. They are usually very well-drained. This permits of deep rooting, as a result of which the roots are able to reach this limestone and to be benefited by it.

Considering the fundamentally important benefits to be derived from liming the soil, both in terms of crop improvement and of extra values to animals and man, one is impressed with the fact that the rate of increase in consumption of liming materials is not as rapid as that of fertilizer. We are now using about 18,000,000 tons of fertilizer, which is nearly 70 percent of the tonnage of liming materials. It appears probable that fertilizer tonnages will surpass those of liming materials in the relatively near future.

Selling is the Answer

Fertilizer is being aggressively sold, whereas producers of liming materials tend more to be satisfied with whatever orders may come their way. This means that a great many farmers who should be buying lime are buying extra fertilizer instead. There is reason to believe that if an extra 50 cents was added to the present selling price of every ton of liming material and the $13,000,000 thus made available was used in sales promotion for lime, this would result in great advantage to the producer of liming materials, the farmer who uses them, and the man who consumes the products of the soil.

Everybody agrees that acid soils should be limed. There is general acceptance of the principle that liming is essential for high levels of productivity of most crops. It is my opinion that the industry would be well advised to carry on continuously a well-documented advertising program that is designed to educate the public to a realization that the liming of acid soil is essential not only for the benefit of the soil, the crops that grow on it, and the livestock to which the crops are fed, but for the sake of the people who consume the products of the farm as well. The primary aim of man is to improve conditions for man himself. The starting point is the soil. And lime is the first requisite of a productive soil.

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Restrictions Affecting Producers

J. B. AND R. E. WALKER, INC., Cottonwood Heights, Utah, was ordered by the District Judge to close its $350,000 gravel operation, located at the mouth of Big Cottonwood Canyon. Property owners in the area had complained about noise, dust and the blinding lights of the pit operations. The judge issued his decision after hearing testimony since October 19. Two of the plaintiffs also were awarded right to the use of a road they had charged was blocked by pit operations. The pit was declared a public nuisance, and the company was given until five days after signing of the decree to close the pit. The preparation of the decree was expected to take considerable time. No damages were awarded. Subsequent trials will be held on damage suits of each plaintiff, the parties agreed.

Another "public nuisance" controversy has been taking place at Loveland, Ohio, in the vicinity of "Little Pittsburgh." Residents there have won a fight against a municipally-owned gravel plant. The city council approved removal of the plant to another site to satisfy complaints of nearby residents of excessive dust and bad odors.

Other such suits and controversies have been experienced recently in various sections of the country. Following are some of the other companies thus involved.

J. L. SHIELY CO., St. Paul, Minn., recently purchased an option on 11 acres of land near Mendota, Minn., for the opening of a quarry. Local residents protested the rezoning of the land from agricultural to industrial, even though the company had offered to beautify a 1600-ft. strip of land and to fill in a worked-out pit, at a cost of $40,000.

KELLEY ISLAND LIME & TRANSPORT CO., Cleveland, Ohio, is protesting a county commissioners' recent ruling against the dredging of sand from Lake Erie. The commissioners had contended that the dredging caused great damage to the property by washing of banks and loss of beach on property abutting the shore. Since

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the chairman of the county board had admitted that it has not been proven that the dredging caused the erosion, the company contends that it should not be penalized until the claim can be proven, and also, that the company is performing an essential function for construction and defense work by dredging for sand.

FRANCE STONE CO., Bellevue, Ohio, is the defendant in a petition filed by 47 Bellevue property owners against the company's quarry operations. The property owners have asked that the company be permanently enjoined and restrained from operating its quarry and doing blasting within the residential section and from discharging explosives in such quantities or amount that will cause damage by concussion or vibration to homes in the northwest part of the town. According to the petition, blasting operations by the company are in excess of the limit fixed by Bellevue ordinance and the force of the concussion and the vibration of the earth and rock strata has damaged all houses of the plaintiffs through the cracking of plaster in the ceilings and sidewalls and by the cracking of the foundations of many homes.

STANDARD LIME AND STONE CO.'S McCook, Ill., plant is the object of an injunction suit seeking to halt permanently operations of the company's refractory plant on the grounds that it is a nuisance to village residents. The suit charges that the Standard company, in its production of dolomitic refractories, pollutes the area with limestone dust. The plant is three-quarters of a mile from the village residential section and has been in operation about 10 years. On February 7, the Superior Court judge issued a writ of mandamus directing McCook to grant a building permit for the construction of an additional rotary kiln and shelter. The project will cost approximately $600,000 and will include a dust collector to minimize air pollution. Even though the village attorney has indicated he will appeal the ruling of Judge Sbarbaro, the company plans to begin construction immediately. The writ was sought after McCook refused to issue a building permit. Judge Sbarbaro ruled there is no proof that operation of the proposed kiln would create a nuisance.

To Install Two Kilns

DEWEY PORTLAND CEMENT CO., Kansas City, Mo., has announced an expansion program designed to improve and modernize its plant at Linwood, Iowa. A major feature of the expansion will be the installation of two new 11- x 375-ft. rotary kilns, at an expenditure of $2,000,000. The kilns, similar to one recently installed (see ROCK PRODUCTS, August, 1950), will each have a daily capacity of 2500 bbl. of cement clinker. Installation of the first kiln is expected to be completed in about 12 to 14 months, and the second, six to eight months later.

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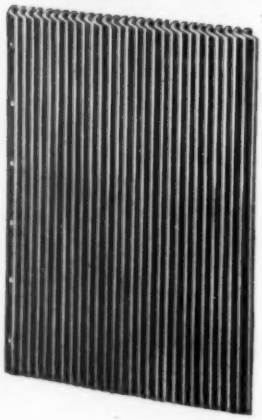

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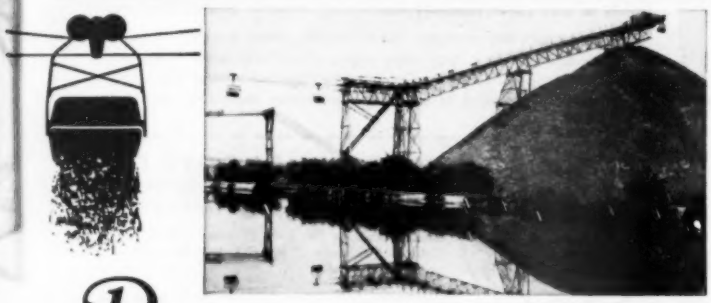

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Sand and Gravel Production

PRODUCTION OF SAND AND GRAVEL in 1949 declined slightly from the record level of 1948, as reported to the Bureau of Mines, but the output was still well above the previous record established in 1942. The value of sand and gravel produced exceeds the $200,000,000 mark for the third consecutive time.

The 1949 sand and gravel production totaled 319,104,000 short tons valued at $248,443,000, a decrease of 0.1 percent in quantity and 2 percent in value compared with the output of 319,266,000 tons valued at $252,498,000 in 1948. In general, industrial consumption slumped somewhat, but sand and gravel continued to benefit from the high rate maintained in construction activity during the year.

In 1949 California was the largest producer, followed by Michigan, New York, Illinois, Wisconsin, Texas, Ohio, Minnesota and Pennsylvania, in the order named. These nine states, each with an output exceeding 11,000,000 short tons, accounted for 51 percent of the total production.

The output of sand and gravel from non-commercial or government-and-contractor operations in 1949 accounted for 28 percent of the total tonnage, compared with 27 percent in 1948. The value of this output represented 15 percent of the total dollar value for the industry. The increase in output may be accounted for largely by the increased utilization of material in paving construction. States reported 50 percent of the total government-and-contractor output in 1949, counties 39, federal agencies 9, and municipalities 2. In 1949, contractors furnished 50 percent of the government-and-contractor tonnage, as they did in 1948. The average value of non-commercial production decreased from 48 to 42 cents per ton in 1949.

The average plant output of commercial operators, except railroad plants, approximated 92,000 short tons in 1949 compared with 96,000 tons in 1948. Plants producing 100,000 to 200,000 tons in 1949 accounted for 21 percent of the total output, the largest quantity produced by any one group. Plants producing more than 500,000 tons annually decreased from 63 to 57 and furnished 23 percent of the production. The less than 25,000-ton group showed the greatest expansion in the number of plants—from 916 to 953.

Truck transportation in 1949 moved 41 percent of shipments from commercial plants (69 percent of total commercial and government-and-contractor output). Railroads carried most of the balance, but their portion of the total decreased from 25 percent in 1948 to 22 percent in 1949. Shipment by waterway was maintained at 6 percent, while 3 percent in 1949 was unspecified as to mode of transportation.

The demand for sand and gravel by

the construction industry in 1949 showed a slight overall increase over 1948; building sand remained at about the same level. However, increases in building gravel and sand and gravel for paving reflected the high rate of construction activity. The output of industrial sands declined in 1949. These decreases ranged from 1 percent for fire or furnace sand to 26 percent for molding sand; the production of filter sand, however, was 20 percent higher than in 1948.

The total number of men employed in the sand and gravel industry in 1949 averaged more than 26,000, a slight increase over 1948. The average number of days worked decreased from 246 in 1948 to 232 in 1949, while the average production per man per shift increased from 37.2 to 37.4 short tons. It has been estimated that production of commercial sand and gravel increased 10 percent in 1950 over the 1949 figure.

Magnesium Plants to Be Rehabilitated

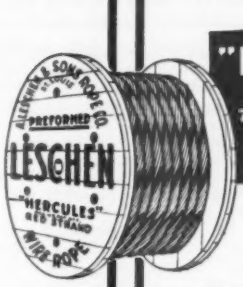
DIAMOND MAGNESIUM CORP., Painesville, Ohio, a subsidiary of Diamond Alkali Co., is being rehabilitated under a government contract by H. K. Ferguson Co., Cleveland, Ohio. The plant, which was constructed in 1941 for defense production, has been idle since 1945. The company expects to start production of magnesium in early spring of this year, and during the next two years will produce approximately 72,000,000 lb. of the metal.

The Mead magnesium plant near Spokane, Wash., which has also been idle since 1945, is being rehabilitated under a joint government contract by Morrison-Knudson Co., Boise, Ida., and H. K. Ferguson Co., Cleveland, Ohio. The $1,500,000 project to put the plant in operation again will require about 90 days.

The government is also putting back into operation three other of its magnesium plants. The Velasco, Texas, plant will go into operation in May, and will be operated by Dow Chemical Co. It is counted on for 160,000,000 lb. of the metal in two years.

The Manteca, Calif., plant will begin operations in July and will be operated by Kaiser Aluminum & Chemical Corp., and is expected to turn out about 40,000,000 lb. in the same period. The Kaiser company operated this plant during World War II under the name of Permanente Metal Corp. It will cost the government about $3,775,000 to rehabilitate these two facilities. A fifth magnesium plant at Wingdale, N. Y., is also being rehabilitated.

An additional improvement program for magnesium production may be undertaken by the U. S. Bureau of Mines, at a cost of $350,000. Consolidated Services, Seattle, Wash., will do the engineering if this project is approved.



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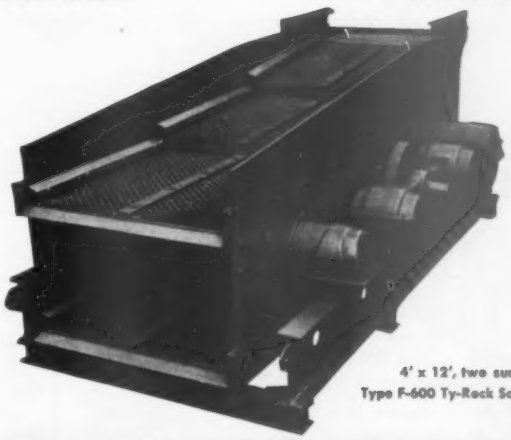

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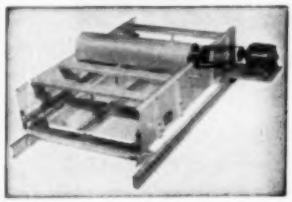

Yes, the initial cost of this Screen is low—but of greater importance is its dependability, low operation and maintenance costs. That's where the Universal is a true money-maker!

Write today for prices, and Catalog No. 109 on Screens and Screening.

UNIVERSAL VIBRATING SCREEN CO.
RACINE — — WISCONSIN

MANUFACTURERS NEWS

Caterpillar Tractor Co., Peoria, Ill., has announced the creation of an additional sales division to meet the expanding needs brought on by the national emergency. To staff the new organization, known as the Plains division, the following promotions have been announced: Kenneth F. Ames will become sales manager with Lee Morgan, Gordon Fowler, E. A. Tiarks and W. F. Jordan serving as assistant sales managers. Related organizational changes have also been announced. The engine sales department, managed by H. W. Smith, will now operate as the industrial division of the general sales department under the administration of H. H. Howard, director of sales. Mr. Smith will continue as manager of the division. The sales training division will suspend organized training classes, and all other functions of this division will be transferred to the sales development division, headed by C. E. Jones.

The Oliver Corp., Chicago, Ill., has announced the election of W. E. Miles as vice-president in charge of crawler tractor and industrial sales. Mr. Miles, who joined the company in 1919, was formerly manager of the industrial division.

Chicago Wheel & Mfg. Co., Chicago, Ill., announced that Arthur T. Dalton, secretary of the company, has been

In plants handling Cement, Lime, Gypsum, Sand, Gravel, Crushed Stone, etc. the WEIGHTOMETER is used for fast accurate production.

WEIGHTOMETER gives a continuous, automatic, and accurate weight record of materials in transit at an extremely low operating cost. All producers of bulk materials handled by belt conveyors need this dependable check on production figures supplied by MERRICK WEIGHTOMETER.

Send for Bulletin 375

Merrick Scale Mfg. Co.
Passaic, New Jersey

FREE SERVICE
for Buyers

Here is the quick way to get information and prices on machinery and equipment. Just check the item (or items) listed below about which you desire information. Then send this list to us, and we will take care of the rest.

TEAR OFF HERE

.....Admixtures, Aggregate
.....Aftercoolers, Air
.....Aggregates (special)
.....Air Compressors
.....Air Separators
.....Asphalt Mixing Plants
.....Bagging Machines
.....Bags
.....Barges
.....Batchers
.....Belting, Conveyor, Elevator, Power Transmission
.....Belting, V-Type
.....Belt Repair Equipment
.....Bin Level Indicators
.....Bins and Batching Equipment
.....Blasting Supplies
.....Block Machines Concrete Building
.....Bodies, Trailer
.....Brick Machines and Molds
.....Buckets
.....Bulldozers
.....Cars, Industrial
.....Classifiers
.....Clutches
.....Coal Pulverizing Equipment
.....Concentrating Tables
.....Concrete Mixers
.....Concrete Mixing Plants
.....Concrete Specialty Molds
.....Concrete Waterproofing and Dampproofing
.....Conveyors
.....Crushers
.....Coolers
.....Cranes
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.....Dewatering Equipment, Sand
.....Diesel Engines
.....Dragline Cableway Excavators
.....Draglines
.....Dredge Pumps
.....Drilling Accessories
.....Drills
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.....Dust Collecting Equipment & Supplies
.....Electric Motors
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.....Explosives & Dynamite
.....Fans and Blowers
.....Flotation Equipment
.....Gasoline Engines
.....Gear Reducers
.....Generator Sets
.....Grinding Media
.....Gypsum Plant Machinery
.....Hard Surfacing Materials
.....Hoists
.....Hoppers
.....Kilns: Rotary, Shaft, Vertical
.....Locomotives
.....Lubricants
.....Mills
.....Pulverizers
.....Pumps
.....Scales
.....Screen Cloth
.....Screens
.....Scrubbers: Crushed Stone, Gravel
.....Shovels, Power
.....Speed Reducers
.....Tanks, Storage
.....Tractors
.....Trucks, Industrial
.....Trucks, Mixer Body
.....Trucks, Motor
.....Vibrators
.....Welding & Cutting Equipment
.....Winches
.....Wire Rope

If equipment you are in market for is not listed above, write it in the space below.

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Send to:

Research Service Department

ROCK PRODUCTS

309 W. Jackson Blvd. • Chicago 6, Illinois

Your Name ..... **Title**.....

Firm Name .....

Street .....

City ..... **State**.....

RP-4

appointed to the advisory committee, Abrasive Industry of the National Production Authority in Washington, D. C.

Detroit Automotive Products Corp., Detroit, Mich., has announced the appointment of L. A. Armentrout as Eastern regional manager. He will be in complete charge of distribution, sales and servicing of Thornton drives, Load-Booster third axle units and NoSpin differentials through the company's distributor outlets in the states of New York, New Jersey, Connecticut, Massachusetts, Vermont, New Hampshire, Maine, Rhode Island, Maryland and Delaware.

The Baker-Raulang Co., Baker Industrial Truck Division, Cleveland, Ohio, announced the appointment of three new sales and service representatives. In the New York metropolitan area and northern New Jersey, The Baker-Rauling N. Y. Corp. and the Material Handling Equipment Co. have been combined into a new organization known as the Material Handling Equipment Co. with offices in New York City. In central and northeastern New York state the Material Handling Co. has been appointed to handle all sales, service and engineering for the firm, with headquarters in Syracuse. The Houston branch of the Dillon Scale and Equipment Co., Inc., will represent the company in the area of Texas which borders the Gulf of Mexico.

Worthington Pump & Machinery Corp., Harrison, N. J., has announced the appointment of Wilbur R. Leopold as assistant to vice-president T. Cruthers. He was formerly manager of the Detroit office and will be succeeded in this position by Clarence S. Wentworth who has been general line salesman in Chicago. J. J. Thompson has been named manager of the sales personnel and training division in Harrison, N. J. He was formerly assistant manager of the Cincinnati office. Announcement has also been made that the Friel-Detroit Co., Detroit, Mich., has been appointed distributor to sell and service air compressors in Detroit and a 100-mile radius of the city.

SHARPER SIZING
GREATER FLEXIBILITY
HIGHER PRODUCTION
THROUGH Selectro Control
OF YOUR FINE SCREENING OPERATIONS

Selectro
VIBRATING SCREENS

SPECIAL FEATURES

- Selective Throw: 8 vibration adjustments can be made while unit is in operation.
- Adjustable Tilt: Quick Control of Flow of Material being screened.
- Easy Cloth Change • Quick Opening Top and Ends.
- Lubrication: Crank case variety, borrowed from the automobile, assures perfect lubrication and easy oil change.
- Stabilizers rigidly control tilt angle at all times.
- Rubber mounting controls vibration. All moving parts fully enclosed for safety.

Selectro Control of your fine screening or scalping, involving removal of lumps or foreign matter from extremely fine materials, is the one means of securing greater capacity at sharper size gradations.

Selectro 8-way vibration adjustment and easily controlled tilt enables your operator to maintain maximum screening efficiency at all times and quickly compensate for variation in material consistency. All adjustments are made while screen is in operation. No special tools required.

Selectro Engineers can answer your fine screening problems. You are not obligated by asking for their recommendations.

Productive Equipment Corporation
2926 W. Lake Street, Chicago 12, Illinois

CANADA
Canadian Locomotive Co.
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AFRICA
Wright, Berg & Head, Wrightson, Ltd.
Johannesburg, So. Africa

CONTINENTAL EUROPE & INDIA
Head Wrightson & Co., Ltd.
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Slurries... handled at lower cost

The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

Buy WILFLEY for Cost-Saving Performance

A. R. WILFLEY & SONS, Inc.
Denver, Colo., U.S.A.
New York Office: 1775 Broadway, N.Y.C.

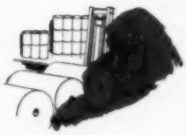
WILFLEY centrifugal PUMPS

HAYWARD BUCKETS
WON'T QUIT OR CAUSE TIME OUT
A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.
THE HAYWARD COMPANY
202-204 Fulton Street
New York, N. Y.

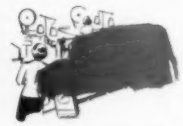
Behind
HAMMOND
Multi-Wall
BAGS

. . . are the features illustrated plus a thorough understanding of your shipping bag requirements

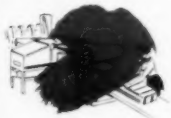
The preference for Hammond Multi-Wall Bags continues to grow steadily because of an ever-increasing list of satisfied customers in the cement, rock products and every industry where Multi-Wall Bags are used.



★ HIGHEST QUALITY PAPERS AND MATERIALS



★ PLANT EFFICIENCY



★ MODERN MACHINERY

★ PRIDE OF WORKMANSHIP

Write today for your copy of our booklet—
"To Serve You Better
with Hammond Multi-Wall Bags"

HAMMOND BAG & PAPER COMPANY

General Offices: Wellsburg, W.Va. *Plants in* Wellsburg, W.Va. and Pine Bluff, Ark.

Representatives in the following Cities:

Chicago, Ill. Minneapolis, Minn. New York, N.Y. Bluefield, Va. Philadelphia, Pa. Columbus, Ohio
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LIL CHAMP

BOYS, THOSE CHAMPION C-30 ELECTRODES SAVE PLENTY ON DOWN-TIME. LOTS OF REPAIRS CAN BE MADE WITHOUT DISMANTLING — AND THE WEAR WE GET FROM BUILT-UP PARTS BEATS ANYTHING WE'VE EVER TRIED!

BLUE DEVIL CONSTRUCTION CO.

IT'S NO LONGER A PROBLEM TO WELD PULLEYS OR SHEAVES AND OBTAIN MUCH LONGER SERVICE LIFE WHEN WE USE CHAMPION C-30 ELECTRODES... THE WELD DEPOSIT IS TOUGH... POROSITY-FREE AND MACHINES FAR BETTER THAN A MILD STEEL WELD!

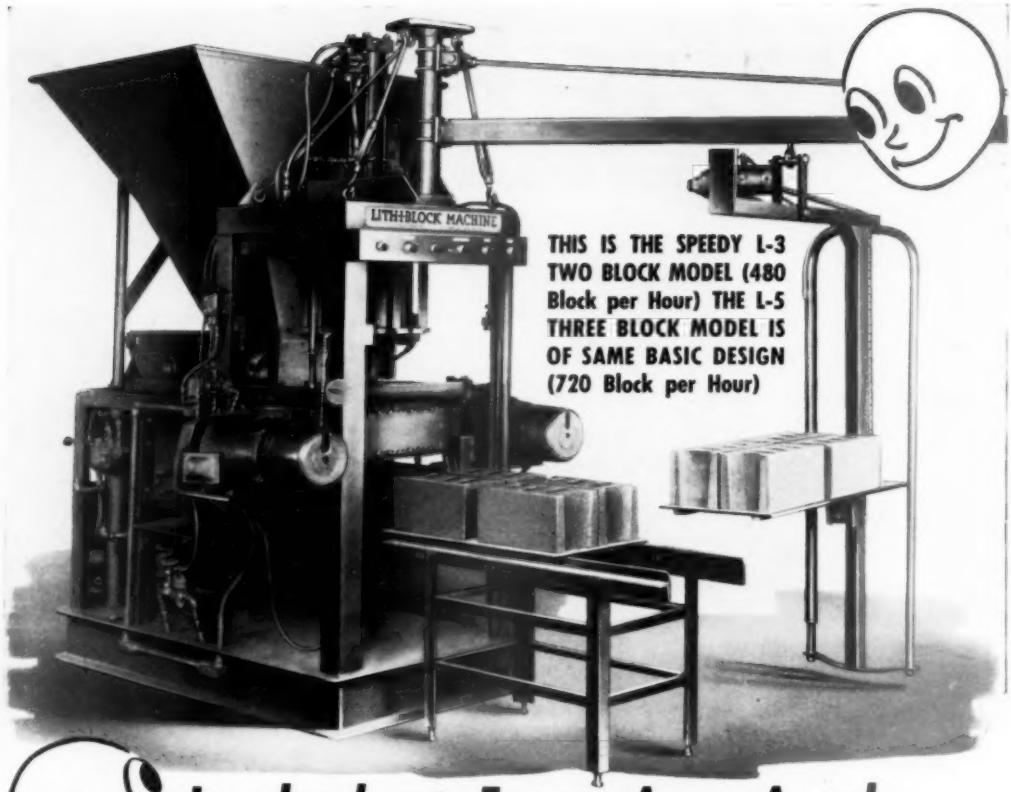
CHAMPION C-30 ELECTRODES ARE IDEAL FOR BUILDING UP SHAFTS AND OTHER MOVING CONVEYOR PARTS...

THE CHAMPION RIVET CO.
10931 HARVARD AVE., CLEVELAND 5, OHIO
Write for descriptive literature

CONCRETE PRODUCTS

A SECTION OF ROCK PRODUCTS

Pouring a multi-story concrete structure in New Orleans



THIS IS THE SPEEDY L-3 TWO BLOCK MODEL (480 Block per Hour) THE L-5 THREE BLOCK MODEL IS OF SAME BASIC DESIGN (720 Block per Hour)

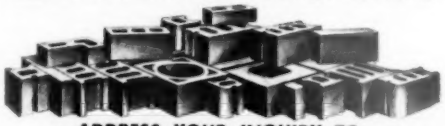
Looked at From Any Angle, It's The Machine That's Engineered To FIT THE AGE!

If your business can stand some streamlining — greater production efficiency — greater handling economy — greater time-saving in cubing and mold box changeovers — then the key to your whole program is found in the smoothly efficient straightline LITH-I-BLOCK Machine. Ask any LITH-I-BLOCK producer.

If you want to cut yourself a bigger slice of the concrete products market in your territory, then you have all the more reason for hitching your wagon to the LITH-I-BLOCK star — for it's a star that is rising higher and higher, brighter and brighter. Architects, builders, contractors and masons — all down the line — go for the clean-cut, uniform, perfectly finished masonry units turned out so accurately by the LITH-I-BLOCK machine.

Get set for the Age in which you are doing business — get the machine that Fits the Age — get going with LITH-I-BLOCK!

LITH-I-BLOCK



ADDRESS YOUR INQUIRY TO

LITH-I-BAR COMPANY

Dept. CP-4 HOLLAND, MICHIGAN

INDUSTRY NEWS

Prestressed Concrete

WILLIAM T. SAVAGE, supervisor of materials engineering at Armour Research Foundation of Illinois Institute of Technology, recently reported on how prestressed concrete may aid in speeding up the installation of walls, roofs and floors. He stated that more research may prove that homes can be assembled more economically and still be as well built as the better homes of today.

Work at the Foundation on the subject is sponsored by Illinois Brick Co. which has been licensed to manufacture Stresterete, a product of Basalt Rock Co., Napa, Calif.

Suit Filed

PRE-SHRUNK MASONRY SALES CORP., Roanoke, Va., manufacturer of cinder block, recently filed a $750,000 damage suit against three equipment and supply companies. The suit was in connection with the collapse of a mixing hopper last July 25, which resulted in property damage and the death of one employe.

The suit claimed negligence on the part of the accused companies to do necessary welding in fabricating the hopper, and to properly inspect and supervise the work. The plaintiff seeks $383,811 for loss of profits resulting from forced idleness of the plant; $16,188 for demolition work and removal of materials, and $350,000 for property damage, after making due allowance for salvage.

Precast Concrete Window Frames

LIVESAY WINDOW CO., INC., Miami, Fla., is finding satisfactory acceptance and use of precast window and door frames by architects, engineers and building contractors. The company has enlarged its plant several times to keep up with increased demand. These frames are claimed to afford measurable savings in both time and money as well as improvement in appearance and structural safety.

The Livesay company has in stock, or will make to order if necessary, pressed steel precision molds of all sizes. Concrete is poured into the molds and vibrated to increase density, strength and smoothness of the finished frames. One of the major projects the company is engaged in at present is supplying window frames for the Jackson Memorial's new service building — a 7-story and penthouse structure. The latest information reported was that 600 precast concrete window frames had been used, with several more to be installed. Another major project will be to furnish 2000 frames for the Washington Park federal housing project. An article about this plant's operations appeared in the September, 1939, issue of ROCK PRODUCTS, p. 53.

N.R.M.C.A. Booklet

NATIONAL READY MIXED CONCRETE ASSOCIATION has announced a new publication dealing with "Cold Weather Ready Mixed Concrete." It consists of a reprinting, with some modifications, of Chapters VIII and IX and Appendix C from the booklet "Control of Quality of Ready-Mixed Concrete." In that booklet, Chapter VIII deals with "Cold Weather Concrete"; Chapter IX, "Accelerators"; and Appendix C, "Formulae Pertaining to Cold Weather Concrete."

The supply of the older publication has been exhausted and it is being put on the out-of-print list as it is in need of revision before reprinting. For the present, N.R.M.C.A. is issuing different portions of the book as separates, as in the one just described. Copies may be obtained upon request to National Ready Mixed Concrete Association, 1325 E. Street, N. W., Washington 4, D. C.

Air Raid Shelters

AMERICAN CONCRETE PIPE ASSOCIATION, Chicago, Ill., has published a brochure which was prepared to serve as a guide in the construction of atom bomb shelters. The material included is that which was used extensively in the construction of bomb shelters in England during World War II. The pictures and much of the information on these shelters were furnished through courtesy of Norcon Ltd., London, England.

The brochure is intended to serve as a basis in coordinating thoughts rather than as a final design. The shelters may be constructed under recreation grounds, school playgrounds, athletic fields, station yards, traffic intersections, parade grounds, airports, parking lots, etc. A.C.P.A. stated that as more detailed information becomes available, it will utilize this information in a more complete design which will be made available. Additional information about the brochure may be obtained by writing to American Concrete Pipe Association, 228 N. LaSalle St., Chicago, Ill.

Labor Bulletins

NATIONAL CONCRETE MASONRY ASSOCIATION, as a means of keeping members informed of constantly changing developments in labor laws, orders and regulations, has announced that each month it will send copies of the Labor Relations Letter. This service is made possible through the N.C.M.A.'s membership in the U. S. Chamber of Commerce.

DELTA SAND AND GRAVEL CO., Delta, Colo., recently installed a new boiler and a 600-gal. water tank to provide hot water for mixing concrete during the winter months. Another improvement at the plant is the addition of a 16- x 18-ft. office building.

A "QUALITY CONCRETE SHORT COURSE" was held December 11, 1950, at the Community Center, Centerville, Iowa. The meeting was sponsored by the Portland Cement Association through arrangements made by its field engineer, W. G. Bester. An illustrated talk on new developments in the construction industry and the making of "quality" concrete was given by Marts D. Blue, district structural engineer for the association.

UNITED CEMENT PRODUCTS CO., Wichita, Kan., has purchased the business, management and sales of Cowan Concrete Coating Co., also of Wichita, as recently announced by M. H. and J. P. Miller, partners in United Cement. The Cowan firm will be incorporated into United Cement as a special department, with policies and services to continue unchanged, including special services which have been performed for Kansas contractors. Ralph Cowan, former manager of the Cowan Company, will become technical consultant with the new firm.

BERKHEISER LUMBER CO., Corinth, Miss., a lumber and building supply concern, recently installed a ready-mixed concrete plant and purchased a fleet of Smith-Mobile truck mixers to meet the needs of contractors and other builders in the Corinth area.

WISCONSIN VALLEY CONCRETE PRODUCTS CO., Wisconsin Rapids, Wis., has amended its charter, increasing its stock from 250 shares, par value, $100, to 500 shares, par value, $100.

CONCRETE PRODUCTS ASSOCIATION of Washington held its annual spring meeting March 17, 1951, at the new Construction Center, Seattle, Wash. Representatives from the federal agencies were present to enlighten members on the subject of government contracts.

FORT WORTH SAND & GRAVEL CO., Fort Worth, Texas, recently awarded safety certificates to 80 employes at a barbecue luncheon. The luncheon celebrated the company's ready-mixed concrete operations, having gone through the year 1950 with 180,000 accident-free man-hours in both the plant operations and in driving. T. E. Popplewell is president of the company.

IDEAL READY-MIX CO., Ottumwa, Iowa, owned and operated by Leon Yates, recently added two new 3-cu. yd. mixers and trucks to the company fleet. Also, new water-control equipment and a materials handling conveyor have been purchased to provide better control of mixes and faster production.

You're not the only one concerned!

We know you're not the only one *concerned* with the truck mixer you're buying. That's why Rex Moto-Mixers are designed to *satisfy all* those who are *concerned* with *your* purchase. For Example:

your operator is concerned...

Your truck mixer operator can be one of your greatest assets—or liabilities. To be a valuable asset he must have a machine that is fast and easy to operate—one that is free from fatiguing vibration—is built with his comfort and safety in mind, keeping him alert and enthusiastic about customer satisfaction.

He wants a machine with simple, easily operated, grouped controls enabling him to mix quality concrete and put it where it is wanted, when it is wanted—a machine that won't dribble concrete all over the job, streets or roads. He wants to satisfy the public and your customer.

He'll satisfy your customers and be a valuable asset when you buy REX.

your mechanic is concerned...

He knows his job depends on keeping machines rolling. He wants to keep your customers satisfied with *complete* on-time deliveries. He wants a machine that requires least maintenance and repair—that's easy to maintain and repair . . . whose parts are readily accessible. Rex Distributors are famous for readily available repair parts.

He'll help satisfy more customers when you buy REX.

Ask your local Rex Distributor to demonstrate Rex profit-making advantages.

CHAIN BELT COMPANY
OF MILWAUKEE
1649 West Bruce Street
Milwaukee 4, Wis.

CHAIN BELT
REX
COMPANY
®

...your customer will benefit!

When you've satisfied all those concerned with the operation of a truck mixer, it's just natural your customer will get better service. He'll have his quality concrete delivered on time, every time. He'll avoid arguments with the inspector and idle crews. He'll save money.

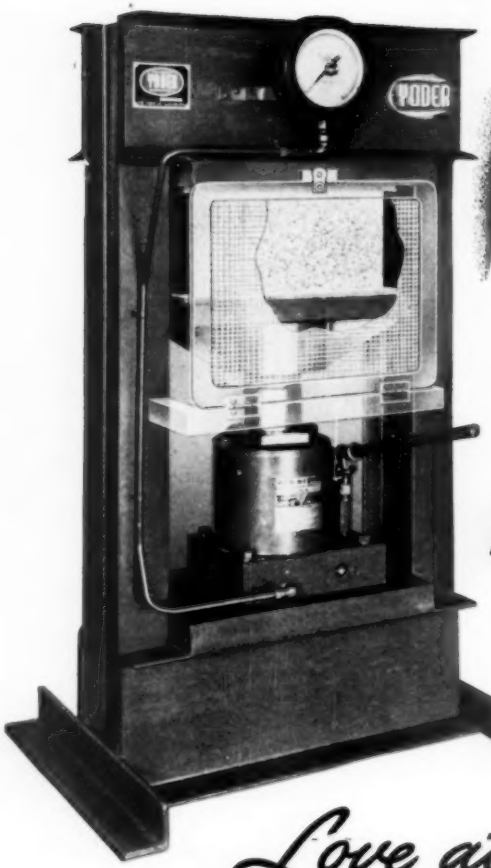
He'll be a satisfied customer when you buy REX.

and, you'll benefit...

You know that keeping your customers satisfied is your most valuable asset in your business success. You want a truck mixer that will give you long years of service . . . one that's low in weight yet with plenty of strength where it's needed. A machine that won't be obsolete in a year or two with spare parts out of date by the introduction of a radically new model. You want a machine that gives you *lowest maintenance cost, least lost operating time, lowest operating cost.* In short, you want the truck mixer that enables you to give your customer the highest quality concrete at the lowest cost and the best possible service.

...WHEN YOU BUY REX

CONSTRUCTION MACHINERY



100-TON Guaranteed Concrete TESTING MACHINE

Love at first sight!

Judging by the inquiries and orders which have been coming in at a steady and accelerating pace, the idea of "on-the-spot testing" with a Yoder compression testing machine has struck a responsive chord in the hearts of realists among products manufacturers. In fact, considering this is a brand new idea and a brand new machine, it looks like a case of love at first sight.

Everybody loves a bargain, and any machine which pays for itself, like this one does, from three to six times every year, must be an extraordinary bargain. Especially when the first—and virtually the last—cost is only $900.00.

Send for brochure, illustrating and explaining the many practical advantages of this machine. It shows not only direct savings, but how it helps avoid disputes with customers and bring about better control of quality through every manufacturing step.

Thus it helps gain and hold the goodwill of the most desirable trade, always a big asset, but especially in lean years, should they come.

ENGINEERING YODER MANUFACTURING

Concrete Machinery Division

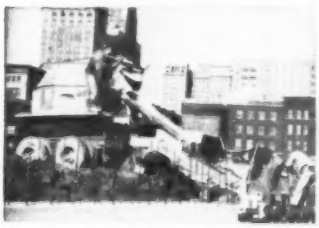
THE YODER COMPANY

5551 Walworth Avenue • Cleveland 2, Ohio

17 Years Young and 3,100,000 Cubic Yards to show for it!

126-S Worthington-Ransome Big Mixer at Arundel-Brooks Concrete Corporation's Wolf Street plant, Baltimore, shows hardly any sign of wear after having poured 3,100,000 cu yd in its 17 years.

Worthington-Ransome 126-S discharging full 5 cu yd batch in approximately 30 seconds.



One of Arundel-Brooks' 6¼ cu yd agitators pouring a retaining wall at General Sam Smith Park, being built to relieve traffic congestion at Light and Pratt Streets, Baltimore.

In 1950—its 17th year—this veteran concrete mixer poured more than 250,000 cu yds on a single set of liners!

This extraordinary performance of a 126-S Worthington-Ransome Blue Brute concrete mixer is attested to by Arundel-Brooks' records. The machine, given proper maintenance over its lifetime, shows virtually no wear after uncounted hours of profitable service.

Arundel-Brooks operates two other Worthington-Ransome Big Mixers—an 84-S at the Sparrow's Point plant, a 56-S at Brooklyn, Md.

And eight of the company's growing fleet of truck-mounted agitators are Worthington-Ransome Blue Brute Hi-Ups, considered "highly satisfactory in every respect."

These eight are used for most long-distance hauls because their light weight* permits carrying a maximum payload with strict adherence to highway load limits.

FIND OUT WHY THERE'S MORE WORTH IN WORTHINGTON

See your nearby Worthington-Ransome distributor. Worthington Pump and Machinery Corporation, Construction Equipment Sales Division, Dunellen, N. J.

*7,290 lb for the standard 4½ cu yd truck mixer, as little as 6,700 lb for 6¼ cu yd agitator models.

WORTHINGTON

BUY BLUE BRUTES

You'll find you, too, can get the real *performance plus* from Worthington and Worthington-Ransome Blue Brutes—a broad line of construction equipment noted for the rugged quality your type of work demands.

R-1-1

IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

WANT TO CUT DOWN ON "worry smoking?"

JUST CONSULT THE BUTLER ENGINEER!

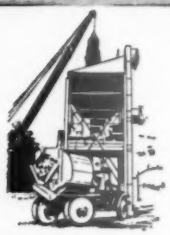
Costs rising? Labor shortage really making itself felt? Competition getting rough? Breakdowns costly and too frequent?

Well, BUTLER claims no cure-all, — but it very often happens that a conference with the BUTLER Engineer brings out some ingenious idea, or a suggestion or two, which leads to faster, more automatic operation, to cost-cutting procedures or to a smoother uninterrupted production flow. And after all, those are the answers to the questions that cause most "worry-smoking."

And of course, if you are buying a Road-builder Batching Plant . . . or a Ready Mixed Concrete installation, head-off your "worry-smoking" before it starts. That's when the BUTLER Engineer

CENTRAL MIXING PLANTS

BUTLER PLANTS are widely recognized as examples of brilliant engineering in a great variety of materials handling problems. Here the experience of the BUTLER Engineer is invaluable.



READY MIXED PLANTS

Ready Mixed Concrete Plants for every production level — engineered by BUTLER for the highest efficiency and lowest cost operation.

AGGREGATE PLANTS

Highly portable, quickly erected, BUTLER Aggregate Plants save time and money in meeting high pressure paving schedules.

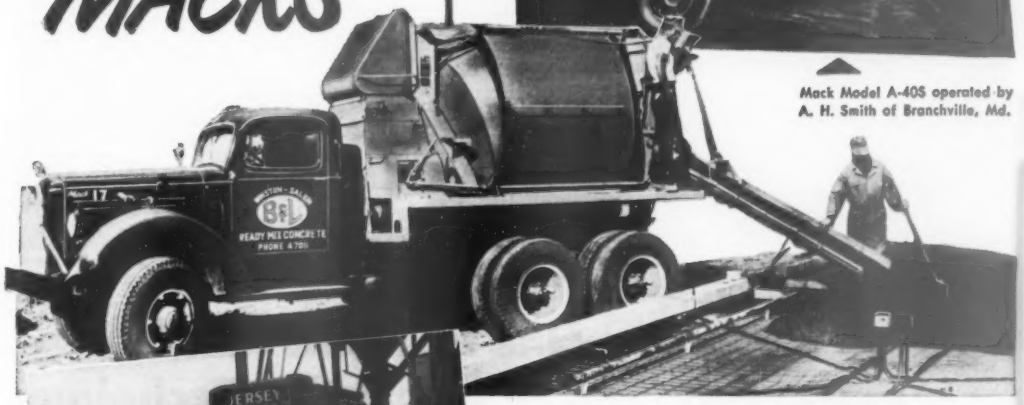
BULK CEMENT PLANTS

A wide range of capacities for every roadbuilding job. Faster batching, split-pound accuracy. Shown is the CR-37-58 providing 650 bbls. capacity.

BUTLER BIN CO.
WAUKESHA, WISCONSIN
989 BLACKSTONE AVE.

READY-MIX CALLS FOR RUGGED MACKS

Mack Model A-40S operated by A. H. Smith of Branchville, Md.



B. & L. Construction Co. of Winston-Salem, N. C. also finds Mack Model A-40S ideally suited for ready-mix service.

For larger capacity drums, Mack Model LJ six-wheeler fills the bill for Jersey Mason Material Co., Jersey City, N. J.

Truck-mounted concrete mixers demand tough, rugged truck chassis . . . trucks that will stand up to the constant strain of mixing heavy loads of concrete.

Mack six-wheel trucks with the exclusive Balanced Bogie bring outstanding advantages to this punishing service. Positive traction regardless of terrain because of Mack's exclusive Power Divider. No overstress of driving parts because of inter-axle differential. No spring twist because of Mack rubber Shock Insulators. No chassis distortion because of inherent flexibility. Extended tire life because of uniform tire loading. Minimum maintenance because of simplicity of design.

It will pay you to investigate the long-term dividends you get from Mack trucks in lasting reliability and economy . . . sustained earning power for the years to come. Your nearest Mack branch or distributor will gladly give you the full story in terms of your particular ready-mix hauling job.

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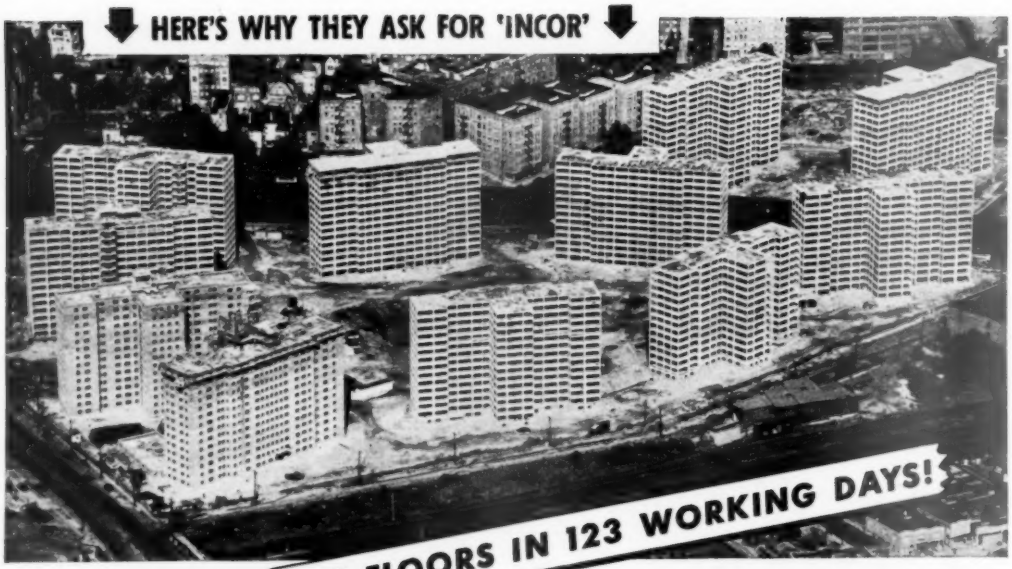
Mack Trucks, Empire State Bldg., New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

HERE'S WHY THEY ASK FOR 'INCOR'



Vertical Assembly-Line Methods Mark Major Advance in Concreting Technique

● Mass production efficiency of the industrial assembly line has its counterpart in construction. Marble Hill Houses, latest in New York City Housing Authority's great project-a-month program, shows this principle at its finest and best—a vertical assembly-line spiralling 14 stories skyward.

Marble Hill consists of 11 identical 14-story buildings, 1,400,000 sq. ft. floor area. With 11 form sets, each used 14 times, CORBETTA CONSTRUCTION CO., INC. erected up to two stories per working day—*165 floors in 123 working days, averaging 1⅓ floors per working day.*

Time saved, four weeks per building, through sound planning and construction know-how, aided by always-dependable performance of 'Incor'* 24-Hour Cement . . . performance which explains why so many leading Ready-Mix operators make 'Incor' concrete available as part of their good service. *Reg. U.S. Pat. Off.

Architect: **JOHN AMBROSE THOMPSON,** New York
Structural Engineer: **TUCKER & EIPEL,** New York
General Contractor for Superstructures: **CAULDWELL-WINGATE CO.,** New York
Concrete Construction by: **CORBETTA CONSTRUCTION CO., INC.,** New York
Ready-Mix 'Incor' Concrete: **COLONIAL SAND & STONE CO., INC.,** New York

LONE STAR PORTLAND CEMENT
'INCOR' HIGH EARLY STRENGTH PORTLAND CEMENT
LONE STAR AIR-ENTRAINING PORTLAND CEMENT
LONE STAR MASONRY CEMENT

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 17 MODERN MILLS, 125,000,000 SACKS ANNUAL CAPACITY

Ready Mix Producers Enlarge Activities

National association has record membership and diversified program for advancement of quality concrete

THE TWENTY-FIRST ANNUAL convention of the National Ready Mixed Concrete Association, held simultaneously with the thirty-fifth annual convention of the National Sand and Gravel Association the week of February 12 in New Orleans, La., stressed operating problems, cement supply and other subjects in special sessions. In addition, research, a concrete proportioning clinic, taxation, cost accounting, government controls and employe relations were considered in joint sessions with the National Sand and Gravel Association. Many of the papers and discussion on matters of interest to both industries are reported in our report of the National Sand and Gravel Association meeting presented separately in this issue of ROCK PRODUCTS (beginning on page 106).

Officers

Norman J. Fredericks, Koenig Coal & Supply Co., Detroit, Mich., was elected president to succeed William Moore, Boston, Mass., who was given a standing vote of appreciation upon his retirement from office. Richard K. Humphries, Pacific Coast Aggregates, Inc., San Francisco, Calif., was elected vice-president; Robert C. Collins, Warner Co., Philadelphia, Penn., secretary; and Herbert G. Jahncke, Jahncke Service, Inc., New Orleans, La., treasurer.

The board of directors comprises the following: Walter H. Acheson (1952), Somers-Barr Co., Inc., Urbana, Ill.; Robert S. Barneyback (1953), Henry J. Kaiser Co., Oakland, Calif.; Henry J. Brown (1953), The Cook & Brown Lime Co., Oshkosh, Wis.; John B. Donovan (1952), Valentine Concrete Co., Inc., Springfield, Mass.; Arthur J. Egan (1954), Ready Mixed Concrete Co., Minneapolis, Minn.; Walter M. Keeler (1953), The Walt Keeler Co., Inc., Wichita, Kan.; Frank L. Kelly (1952), Colonial Sand & Stone Co., New York, N. Y.; Ezra C. Knowlton (1954), Utah Sand and Gravel Products Corp., Salt Lake City, Utah; Harold M. Lacy (1953), Dallas Concrete Co., Dallas, Texas; Elbert F. Lewis (1953), F. D. Lewis & Son, Greensboro, N. C.; Robert Mitchell (1953), Consolidated Rock Products Co., Los Angeles, Calif.; Russell P. Mumford (1954), The Beckley & Myers Co., Springfield, Ohio; William W. Nass (1954), Syracuse Ready-Mix Concrete Co., Inc., Syracuse, N. Y.; Frank Penepacker (1952), Readymix Concrete Co., Portland, Ore.; John W. Roberts (1954), Southern Materials Co., Inc., Richmond, Va.; Floyd G. Rubey (1954), Dubuque Ready Mix Concrete Co., Dubuque, Iowa; Louis C. Schilling, I. E. Schilling Co., Miami, Fla.; Frank E. Schouweiler (1952), Old Fort Supply Co., Fort Wayne, Ind.; B. F. Devine, Chain Belt Co., Milwaukee, Wis., chairman of the Truck Mixer Manufacturers Bureau, and Nathan C. Rockwood, consulting editor of ROCK PRODUCTS, who is an honorary member.

In addition to the officers, Messrs. Mitchell, Roberts, Schilling and Schouweiler comprise the executive committee.

New officers of N.R.M.C.A. are Herbert Jahncke, treasurer; R. C. Collins, Warner Co., Philadelphia, Penn., secretary; R. K. Humphries, Pacific Coast Aggregates, Inc., San Francisco, Calif., vice-president; and Norman J. Fredericks, Koenig Coal and Supply Co., Detroit, Mich., president

President's Address

President William Moore, in his opening address before a joint session of N.R.M.C.A. and N.S.G.A., paid eloquent praise to the association staff for its many useful accomplishments in behalf of the membership. He mentioned the expert know-how of the staff on matters of administration, operation, research, merchandising, labor and safety as being well beyond the means of individual companies but which is so freely available to members for a small membership fee.

He expressed confidence that the industry will not fail in the present crisis when called upon to supply men and materials required for the defense effort.

The current activities of the association were reviewed. Mr. Moore told of progress being made toward securing low-cost group insurance for companies not now covered by insurance. Studies are being continued on the subject. He commended the work of the special committee on the "Drivers' Manual" for its accomplishment which resulted in publication of the booklet "Your Job" which has been well received by the industry. W. E. Clark, Dravo Corp., Pittsburgh, Penn., chairman of the committee, and E. P. Pearsall, manager of publications for Dravo, were especially recognized for their outstanding accomplishment toward building a better relationship between employer and employe.

The work of the association and its directors in efforts to secure better allocation of cement was reviewed. According to Mr. Moore's figures, the ready-mixed concrete industry now requires about 40,000,000 barrels of cement annually and is now the largest single user of cement.

The value of the many regional meetings held over the country was recognized by Mr. Moore as an effective approach to the solution of problems and he considers them to be increasingly desirable.

He credited the fact that the asso-

ciation now has 433 member companies and 62 associate members to the reputation for accomplishment that the association enjoys. During 1950, 92 active members were enrolled. The laboratory facilities and scope of engineering research in progress were also given appropriate recognition by Mr. Moore. In conclusion, he expressed his thanks to the staff, the directors and membership for their cooperation during his term of office.

Ready Mix Operations

"Mounting Truck Mixers for Maximum Pay Load" and an open forum on operating problems were the subjects of a special session of the National Ready Mixed Concrete Association.

J. W. Bauman, vice-president, The White Motor Co., Cleveland, Ohio, and H. F. G. Pelsue, general sales engineer, The Jaeger Co., Columbus, Ohio, started the meeting off with a discussion of the problem of distributing truck mixer loads to secure maximum pay loads consistent with legal limitations on axle loads.

Mr. Bauman first announced a new emergency service corps plan devised by his company in order to facilitate maintenance of an adequate inventory of spare parts. Under the plan, a metal tag identifies every component on each job for ready identification in the transfer of parts. All parts depots are being directed to provide this service.

Other things being done are the issuance of parts availability bulletins and others telling of substitutes and how to maintain and keep equipment in serviceable condition. Users of White equipment were invited to participate in the new plan in order to meet coming crises with a planned program. Charts were shown to illustrate how loads on ready-mixed concrete trucks are being shifted forward to lessen the loading on the rear axles.

New president of the N.R.M.C.A., Norman J. Fredericks, left, being congratulated by retiring president William Moore

Mr. Pelsue discussed the important factors and the limitations in design when attempting to shift some of the loading forward from the rear axles. Because most states allow more loading on front axles than can be obtained in actual practice, the tendency is to move the mixer forward on the chassis but, Mr. Pelsue pointed out, there are practical considerations that determine what can be done. For one thing, there should be sufficient space between the cab and the mixer and, for another thing, when the mixer is put too far forward the rear wheels interfere with the discharging of concrete. Use of a longer wheel-base is an approach but it then becomes a matter whether or not loss in maneuverability is considered too important to sacrifice. This likely isn't serious, in Mr. Pelsue's opinion, but cantilever action on the overhang, out from the front and rear drum supports, may result in frame deflection.

Herbert Johncke, Johncke Service, Inc., New Orleans, La., left, with V. P. Ahearn, National Sand and Gravel Association, Washington, D. C.

In answer to whether or not the gear box at the front end which is used to reverse the direction of the drum might be incorporated into the auxiliary transmission of the truck to conserve space, the cost was mentioned as prohibitive unless mass production methods could be applied. Power steering can be applied to trucks not built for it.

Following this discussion of truck equipment, the meeting was thrown open to general discussion of operating problems.

One point of discussion concerned the relation of mixing time and speed to quality of concrete particularly when mixers are loaded to peak capacity. Whereas one producer said that mixer drums were revolved 50 percent more than recommended conventional practice, in handling 5 cu. yd. of concrete in a 4½-cu. yd. rated mixer, another producer said that poor quality resulted from speeding up the drums. Still another producer, who admitted to carrying 8 cu. yd. of concrete in a 5½-cu. yd. mixer, said that he maintained the standard rate of mixer speed and time, with excellent results.

Consensus of opinion seemed to lean toward the necessity for increasing mixing time in handling overloads and that the necessity for greater mixing times with low-slump concrete applies with greater force when mixers are overloaded.

One producer said that the increased pressure on the drum seal, when carrying overloads, caused considerable difficulty because of wear on the seals which made it necessary to reduce the load carried below top rated agitator capacity. The answer to that seemed to be one of proper design of seal.

Cement balls in the mixers are causing difficulties to some producers. Opinion seemed to be that the fines in the sand and hot cement may be factors. Control of air content was also discussed. Points brought out were that entrained air is reduced with speeding up of mixers and that the fines, consistency and other factors influence the degree of air entrainment. Mr.

Members and officers of the Wabash Valley Ready Mixed Concrete Association who were attending the N.R.M.C.A. convention included (left to right), front row, John Rudolph, president, Evansville, Ind.; J. F. McCracken, Louisville, Ky.; C. S. Ward, Mt. Vernon, Ill.; Ernest Horne, Indianapolis, Ind.; and A. F. Bieker, Hammond, Ind. Standing are: C. C. Deal, Elkhart, Ind.; R. E. Hutchins, executive secretary of the association, Terre Haute, Ind.; E. C. Scott, Bloomington, Ill.; W. H. Acheson, Urbana, Ill.; and B. C. Milbrath, Gary, Ind. Other members attending but not in the picture included J. W. Hunter, L. L. Shidler, C. P. O'Leary, and Henry Wolf

Discussing the convention activities are Otis H. Manchester, Jr., left, Ralph Teich, center, and Clem J. Frein, right, all from St. Louis, Mo.

Walker mentioned that each percent of air entrained results in a five percent loss in strength of concrete.

Safety Awards

The new officers of N.R.M.C.A. were presented at the final session on Thursday for which Robert C. Collins was chairman. Awards of safety trophies and certificates were made at this meeting to all winning companies in the 1949 N.R.M.C.A. safety competition.

The winner of class A group, for producers delivering 100,000 cu. yd. or more, was Fort Worth Sand and Gravel Co., Fort Worth, Texas.

In the Class B competition for companies producing from 50,000 to 100,000 cu. yd. of concrete during the contest period, Kuert Concrete, Inc., South Bend, Ind., was awarded the trophy and Eberts Brothers Co., Wyandotte, Mich., was given a Certificate of Achievement. Twenty-seven companies entered in Class C competition (producing less than 50,000 cu. yd.) had accident-free records. Fyfe Cement and Supply Co., Amarillo, Texas, with the greatest combined total of yards of concrete produced and man-hours worked in this group, was awarded the Class C trophy.

In recognition of their excellent accident-free records, a Certificate of Achievement in Safety was awarded to the following companies:

G. W. Blakeslee & Sons, Inc., New Haven, Conn.; Terre Haute Concrete Supply Corp., Terre Haute, Ind.; Blake Brothers Co., Richmond, Calif.; Rock River Ready Mix, Dixon, Ill.; Cement-Mix Concrete Co., Erie, Penn.; Nelson Concrete Culvert Co., Mt. Vernon, Ill.; P. J. Keating Co., Fitchburg, Mass.; The Union Sand and Supply Corp., Painsville, Ohio; Krieghoff Supply Co., Adrian, Mich.; Ready Mix Concrete Co., Sioux City, Iowa; Randecker Brothers, Lock Haven, Penn.; The Trumbower Co., Inc., Nazareth, Penn.; Shamokin Ready Mixed Concrete Co., Inc., Shamokin, Penn.; Mooney Bros. Supply Co., New Castle, Penn.; Gethmann Concrete & Material Co., Gladbrook, Iowa; Concrete Materials, Inc., Morristown, Tenn.; Wolf Ready-Mixed Concrete Co., Logansport, Ind.; Stephens Ready-Mixed Concrete Co., Cairo, Ill.; Monroe Ready Mix & Material Co., Inc., Monroe, Wis.; Ready Mixed Concrete Co., Annandale, N. J.; Portland Sand & Gravel Co., Portland, Penn.; Builders Concrete Co., Clinton, Okla.; American Aggregates Corp., Ready Mix Div., Greenville, Ohio; Gallup Sand and Gravel Co., Gallup, N. M.; Watertown Cement Products Co., Watertown, S. D.; Baraboo Concrete Products Co., Baraboo, Wis.

Trophies were presented to the three winning companies by *Pit and Quarry*. Certificates of Achievement in Safety were presented by the association to accident-free companies which did not win a trophy.

The Cement Story

Mr. Collins introduced the afternoon's speaker with the remark that this was the first time in the history of N.R.M.C.A. that a cement man had addressed a convention. He was referring to Walter A. Wecker, president of Marquette Cement Manufacturing Co., Chicago, Ill., who presented an interesting and enlightening talk entitled "How Are We Doing?"

Relaxing at the Johncke estate are Mr. and Mrs. Carl R. Olson, Henry J. Kaiser Co., Oakland, Calif.

Mr. Wecker, before discussing the mutual problems of the cement and ready-mixed concrete industries, said that he was not in any sense a spokesman for the cement industry. Then he started on an explanation of the supply situation. "It must not be overlooked that shortages do not always develop because of shortsightedness of the producers," he said. Additional cement capacity can't be turned on overnight either, he continued. The cement industry completed a capacity increase of over 12,000,000 bbl. a year during 1950, the speaker claimed.

The tight supply situation was largely due to the tremendous demand in the last half of 1950 which came about "by reason of the announced intention of the federal government to restrict credit for home building and from an anticipation of federal restrictions on construction in many other classes," Mr. Wecker stated.

Though increases in capacity had been planned, the speaker said that for the most part they did not come into being soon enough to alleviate the artificial shortage. The situation of 1950 may overstimulate cement producers and cause them to overbuild, Mr. Wecker contended. However, there are economic factors which serve to limit expansion. Additional capacity scheduled for 1951 totals about 12,000,000 bbl.

Mr. Wecker commented on cement shipment figures for the last five years. Starting with 1946, when 170,000,000 bbl. were shipped, he continued with 1947, when 17,000,000 bbl. more were shipped, and 1948, when shipments climbed to 204,000,000 bbl. An increase of only 2,000,000 bbl. was registered in 1949. Beyond 1949, further increases in shipments had to come from newly installed capacity. In 1950, 22,000,000 bbl. more were shipped than in the previous year—an increase since 1946 of more than 34 percent, he said. Extrapolation of these figures indicates that the industry may ship over 10,000,000 bbl. more in 1951, to a total of 240,000,000 bbl.

The many types of cements required were factors the speaker mentioned as affecting local supply. So many types have to be manufactured that not all can be stocked at one time. He then discussed the duplication of types caused by the air-entraining cements. There is no standard "dosage" of an air-entraining agent which will produce the exact results required in concrete under all conditions, he said. Because of this, he felt the intergrinding of an air-entraining agent with cement was unfortunate. This requires standardization of something that actually cannot be standardized. However, he felt that ready-mixed concrete producers can add air-entraining agents in the proper amount themselves, thus reducing the number of types of cement necessary to be stock-

ed, and providing the means for making different mix designs. Another advantage, he said, is the feasibility of producing a mildly air-entraining concrete (about 2 to 3 percent air) where normal concrete is called for but where extra good workability, uniformity and facility of discharge are needed or desired.

Mr. Wecker mentioned the value of statistics provided by the ready-mixed concrete industry, showing the volume of concrete produced. However, he suggested that these statistics would be of more value if they were broken down into states or some other subdivision.

The pricing of cement and the Federal Trade Commission rulings drew comments from the speaker. He said that his company, along with many others, believes that anyone has the right to sell at delivered prices and to meet lower prices of competitors whenever he considers it good business to do so. This, of course, differs with the economic ideas of the F.T.C., ideas which result in entirely inconsistent rulings, he said. In view of the double talk from this agency, Mr. Wecker claims it is no wonder that the average businessman has completely lost track of the basic laws and of his rights. This can only have harmful effects upon the public, he continued. It has raised the price of heavy goods. Therefore he urged that all producers do their utmost to get Congress to clarify the law.

Cement prices, the speaker pointed out, have remained remarkably stable. For the first 11 months of 1950, the cement index stood at 136 in relation to the 1926 base, all building materials combined stood at 205, and all commodities stood at 160. These prices, he pointed out, reflect the fact that they are based upon depreciation charges applying to plant facilities built many years ago at costs much less than those prevailing today. They are also due to the fact that total depreciation charges today are very low in relation to the large original investments. Mr. Wecker commented that "prices would have to be materially higher if current depreciation charges were on the basis of full plant cost values as of today. The buying public is, of course, the beneficiary in this situation."

The speaker closed with some "plugs" for the Portland Cement Association, crediting it for much success in selling quality concrete through its short courses. His concluding remark was that it is quality concrete and not the volume of business the cement industry enjoys from the ready-mixed concrete industry that forms the relationship between the two industries.

State Officials Meeting

State and district officials of ready-mixed concrete associations held a luncheon meeting during the convention to exchange ideas. Among the organizations represented were the Southern California, San Francisco, Wabash Valley, Minnesota, Iowa, Utah, Wisconsin and Ohio Ready Mixed Concrete Associations. Also attending the meeting were individuals interested in forming new state associations. Harris Snyder and E. J. Nunan, The Buffalo Slag Co., expressed interest in forming a New York State association.

Claude L. Clark, secretary of the Ohio group, was asked to preside. An informal discussion occupied most of the meeting, each officer explaining the activities of his association. In general, it would seem the activities of each group are somewhat specialized. Thus it developed that the Ohio association's activities lie more in promoting legislation beneficial to the industry; Wabash Valley emphasizes concrete technology; and most Western associations emphasize public relations.

During the course of the meeting Mr. Clark recommended that, during its board meetings, the National Association should appoint someone from the N.R.M.C.A. to preside at future meetings of state and district officials.

P. J. Akmadzich, City Rock Co., Los Angeles, Calif., left, and H. E. Feraud, Southern California Rock Products Association, Los Angeles, get together between sessions

Norman J. Fredericks, new president of N.R.M.C.A., receiving congratulations from his father, George J. Fredericks. Both men are with Koenig Coal & Supply Co., Detroit, Mich.

Ohio Luncheon

Ohio Ready Mixed Concrete Association held its mid-winter meeting and luncheon at the Roosevelt Hotel during the N.R.M.C.A. convention. C. A. Persons, president of the association, presided at the meeting which was attended by 83 members and guests. Following the interim report of the secretary, Claude L. Clark, cement salesmen from companies supplying Ohio producers commented on the prospects for a good supply of cement in 1951. Four talks were presented. Herbert Rusk, Mansfield, talked on "How Much Profit Do You Make on a Cubic Yard of Concrete?" R. P. Mumford, Springfield, prepared a paper "Which Do You Prefer—Central Mixing, Transit Mixing, or a Combination of Both?" In his absence, this was read by Paul Hunt, Marion. Julius Warner, Cincinnati, led a discussion of heating charges, waiting charges, zoning charges and quantity charges. J. A. Nicholson, Toledo, gave a talk on "Controlling Air in Concrete."

Mr. Clark in his report said that 1950 was a good year for ready-mixed concrete producers. Though some strikes slowed delivery of cement, the 1950 state highway program was the biggest on record, and will remain uncompleted. He called on producers to continue lending their support to bond issues for public construction. The Anderson sales tax case, which was discussed at the last meeting in June, 1950, still has not been decided, Mr. Clark reported.

The Oregon "ton-mile" tax on highway vehicles was mentioned. Mr. Clark said that there is an attempt being made to increase axle weight limits. He then read a report of the Maryland test road project. Also mentioned was the Ohio legislation introduced to raise rates for commercial vehicles.

The remarks of the cement company representatives were optimistic in general. One of the severest shortages in the country occurred in northeastern Ohio because of a prolonged strike. Other strikes also restricted supplies to a great extent, but some representatives said a severe winter and building controls had afforded the opportunity to fill cement silos the fullest in nearly ten years.

Stanton Walker doing some research around a horseshoe stake at the Johncke estate

PIPE PRODUCERS TALK SHOP

Design, protective coatings, plant operations, specifications and pipe performance discussed by A.C.P.A.

THE AMERICAN CONCRETE PIPE ASSOCIATION held its 43rd annual convention at the Waldorf-Astoria Hotel, New York City. Concurrently, the American Concrete Pressure Pipe Association held its second annual convention. The dates were February 28 through March 3. It was one of the most successful meetings ever held by the manufacturers of concrete pipe. The registration totaled 315, with 90 ladies also present, making it the largest concrete pipe meeting to date from an attendance standpoint.

The first open session followed the noon luncheon on Friday, March 2. At that luncheon, C. V. Amenoff, editor, Elburn (Ill.), *Herald* (and six other rural papers) talked on "A Modern Crusade." Editor Amenoff made an eloquent and extremely humorous appeal to the concrete pipe manufacturers to join with him in his crusade that stemmed from his belief that all the world's troubles could be solved by following the "Amenoff Arc Method of Dunking." He told of the different dunking techniques, such as the "Dip and Drip" method, the "The Drop of Slop Method," and others, but demonstrated his invention, the "arc" method.

Concrete Pipe Design

The Friday afternoon session was under the chairmanship of president E. H. Fox. The first speaker was J. E. Miller, who showed slides, test data, curves, etc., on "Design and Test of 84-in. Concrete Pipe." Mr. Miller illustrated with slides several types of reinforcing used in the manufacture of the large diameter pipe, and gave the results of the tests on this pipe. It was obvious that the type and location of the reinforcing in pipe of this size plays an important part in the pipe's ultimate strength. In the discussion that followed, Dick Carroll wanted to know why hand-cast pipe was taking the spotlight off of machine-made pipe. Elmer Leuliette, Universal Concrete Pipe Co., said that the influence of the "rubber crowd," meaning the manufacturers of rubber gaskets, was beginning to be felt, and because of the high price of these rubber gaskets, it was often more economical to hand-cast 8-ft. lengths of pipe than to produce the machine-made 4-ft. lengths, which on a footage basis would require two gaskets to one for the longer pipe. Both Mr. Carroll and Mr. Leuliette stressed that machine-made pipe were better than the cast. E. F. Bespalow, Choctaw, Inc., Memphis, Tenn., thought it was time for a research program to be set up on "Joints and Types of Joints," as often rubber connectors ran into considerable money. One speaker said that gaskets of asphalt and rubber "had to move to stay alive" and intimated that trouble might be in the offing. Mr. Bespalow called attention to the lack of oxidation in sealing compounds when the pipe is buried. He described troubles that resulted from using some asphalt seals that failed to fill the joints properly. He told of an asphalt that contained an additive that "set" after being used on the joints. He also called attention to the possibility of rigid joints cracking due to contraction and expansion in the line, and that a pipe line that was alternately hot and cold would be apt to crack.

H. Chutter, Fresno, Calif., asked about the attitude of the clay pipe manufacturer in relation to the subject under discussion. Mr. Bespalow said he sold considerable concrete pipe in his area because of failures of clay sewer pipe.

President E. H. Fox told of some experiences in the Cincinnati, Ohio, area, where he was called upon to make reasonably large diameter pipe to tolerances within 1/32 of an in. but this seemed to be an unusual case for not many had encountered similar specifications. Mr. Smith of Pressure Pipe Co., Ltd., Montreal, Canada, asked for data on figuring loads on a big pipe and a little pipe, both in the same ditch and parallel to

N. T. Stadtfeld, division engineer, Board of Water Supply, New York, N. Y., addressing the A.C.P.A.

each other. He was referred to publications on file in the association office. Another asked about the status of elliptical steel specifications; the secretary-director, Howard Peckworth, said the subject had been referred to the long-range planning committee for action.

E. F. Bespalow told of a recent type of fork truck that he is using in Memphis and which solved the problem of removing large-diameter pipe from the curing kilns. At the same time, they could be used to turn the pipe over. According to his description, the unit is able to handle 48-, 54-, and 60-in. diameter pipe and had hydraulic arms that worked on a compression principle. He had no operating data on the truck, as it had only been in operation one week. It was made by the Hyster Co.

The second subject was a moving picture presented by E. F. Bespalow, taken at his company's plant, and which showed the highlights of its manufacturing processes. Much installation and useful information was included in the picture, and the speaker said he had found the picture to be an excellent method of selling concrete pipe. He stressed the fact that

The 1951 board of direction of the American Concrete Pipe Association. Left to right around the table are: G. D. Williamson, H. W. Heath, E. Leuliette, J. A. Dunn, G. W. Black, G. F. Lillie, President E. H. Fox, R. E. Bearss, Claude J. Kelly, Thomas E. Arp, Ivy E. Smith, J. D. Mollendorf and H. A. Weigand

the picture was not a technical presentation, but rather a merchandising device.

The third subject was another moving picture, this time a graphic display of "Loads on Underground Concrete Pipe." The picture was prepared by the Iowa State College under the direction of Prof. M. G. Spangler. The picture showed (by the use of models) how the shape, depth, and character of a trench can influence the load on a concrete pipe. This was another excellent educational and sales medium, and it was pointed out that members could buy prints of the movie from the association. The picture showed in the very simplest of terms the beneficial effects of a narrow "sub-ditch" in the bottom of a wide ditch, and of the desirability of backfilling a trench where piling was used in such a manner that the back-filling would be carried progressively along with the step-by-step pulling of the trench lining.

Concrete Pipe Lines

The final speaker was C. G. Munger, sales representative of the Amercoat Corporation, 4809 Firestone Blvd., South Gate, Calif. He displayed slides, and had available small samples of a synthetic resin liner plate for concrete pipe that is designed to be used for industrial wastes of an acid, alkali, or corrosive nature. One of these destructive agents, the speaker said, was hydrogen sulfide formed by bacterial action. He told of two types of bacteria, the anaerobic type and the aerobic type. The former creates sulfides from organic matter without requiring oxygen. The aerobic type requires oxygen and will oxidize sulfur compounds to sulfuric acid.

The speaker told of his firm's search for an ideal lining for acid-proofing pipe, and that it finally selected a vinyl chloride resin with a high molecular weight. This material is said to be tough and has a very high resistance to chemicals, is not appreciably affected by oxidation, has low water absorption and is not affected by oils and greases. The material is a black-colored thermoplastic, so that under heat and pressure it can be formed into any desired shape. It also can be welded by a special welding technique using heat and an inert gas, such as nitrogen.

The material is ordinarily cast into 4- x 8-ft. sheets that have a minimum thickness of 0.06 in. The exposed surface is smooth, but the back is cast with some "T" shaped extensions which key the material into the concrete forming the pipe. Mr. Munger showed pictures of installations where sheets up to 16-ft. square were made by welding the 4- x 8-ft. sheets. These were placed around the inner form of the pipe and held in place by metal strap-bands. The concrete was then poured around the form and the plastic lining was thus keyed to the concrete. The plastic liner has a tensile strength of 2920 p.s.i. so it is difficult to tear or rupture, or even to remove from the concrete pipe once it has been set in place. At 300 to 325 deg. F., the plastic becomes tacky and can be pressured or fused into place and connection joints between each length of pipe can be sealed, making one continuous liner.

In the slides shown, several large diameter pipe (in the 6- to 8-ft. range) were displayed with the plastic liner extending ⅜ to ¾ of the periphery of the pipe. Later it was explained that the unprotected part of the pipe was the bottom, or liquid-covered part, and that the plastic liner protected those parts of the pipe where oxygen, bacterial action, and oxidized gases were present. Evidently, where liquids cover the concrete, corrosion does not become too great a problem. The speaker showed, by slides, how the plastic liner was used on rectangular concrete structures employed for disposal of industrial wastes. He said the plastic had been used for two years in a wide number of chemical applications involving nitric and sulfuric acids, gasoline, sodium hydroxide solutions and a dozen or more other corrosive solutions. He said there were several installations going forward in the Southwest.

In the brief discussion that followed it was pointed out that the lining had so far only been used on pipe of 36-in. diameter. This was because of the need to weld the plastic joints after the pipe was in place, which makes it necessary for the workman to have sufficient room to crawl in the pipe to do the job. The speaker said the lining costs from 90c to $1 per sq. ft.

Left to right: H. S. Price, Jr., R. A. Foley, P. R. Hirsh, E. L. Johnson and R. V. Edwards comprise the 1951 board of direction of the American Concrete Pressure Pipe Association

From the left foreground and clockwise around the table are: Mr. and Mrs. George W. Sims, H. D. Graves, Mrs. Malcolm Hirsh, Mr. and Mrs. E. F. Bespalow, Malcolm Hirsh, Mrs. Hugh Kennison, Hugh Kennison and Mrs. H. D. Graves

New York Highway Plan

The forenoon session of the final day of the meeting was under the chairmanship of president E. H. Fox. Following the election of officers, the first speaker, Bertram D. Tallamy, superintendent of public works, state of New York, Albany, N. Y. told the assembly "What the Thruway Means to You."

The speaker said the Thruway now under development by the state of New York was the world's greatest highway project and in essence involved the construction of a superhighway system that would serve the most densely populated areas in the state and would blanket 85 percent of the state's population.

Four men from Illinois. Left to right: W. A. Neff and G. M. Neff, Neff Concrete Products Co., Danville; D. F. Childs and W. A. Russell, Standard Concrete Pipe Co., Springfield

E. Leuliette, center, and E. F. Bespalow, right, take great delight in a story told by E. H. Fox

Pipe in Cold Climates

The second speaker was W. L. Hyland, of Fay, Spofford & Thorndike, Engineers, Boston, Mass. and New York, N. Y., who talked on "Pipe Lines for Utilities in the Frozen North."

The speaker showed slides that revealed the primitive living conditions in some north areas prior to more recent developments. He told of building sanitary plants where 60-deg. F. below zero temperatures had been encountered. In one type of construction, with reference to sewer drainage and/or water supply, the fluids had to be heated at the source to prevent freezing before they reached the disposal area. In a second system, "Utilidors" were used. In some instances these were large diameter concrete pipe in which water lines, sewer lines, etc., were in the main (and larger) pipe lines, and the entire assembly of pipe lines was adequately heated from a main power plant. This system of installation had a high construction cost, but the maintenance and operating costs were lower than for the first-named system. It was indicated that the Utilidor system, when using concrete pipe of sufficient diameter, cost $38.90 per lin. ft.

From the discussion it was revealed that in the area described, older concrete structures were in good shape and did not show signs of deterioration due to the abnormal temperature changes in the far north. The speaker told of building a large structure by first thawing the ground to about 30 ft. in depth, then shaking the bottom by blasting the coarse gravel base, and then going ahead with the construction. The blasting, it was explained, tended to settle the coarse gravel sufficiently so that the building could be constructed on top. The results were said to be satisfactory.

Presentation of Awards

Following Mr. Hyland's interesting talk, plaques were awarded to all past presidents who had not previously received such awards. The men who received these awards were: C. E. Edwards, Des Moines, Iowa, retired; Harold Chutter, Jourdan Concrete Pipe Co., Fresno, Calif.; H. D. Palmore, Kentucky Concrete Pipe Co., Frankfort, Ky.; Ray A. Foley, Gifford-Hill Pipe Co., Dallas Texas; Walter Corbett, Corbett Concrete Pipe Co., Milford, Mass.; O. H. Miller, Choctaw, Inc., Memphis, Tenn.; G. H. Redding, Massey Concrete Products Co., Chicago, Ill.; and R. S. Lander, Sherman Concrete Pipe Co., Little Rock, Ark.

The following men, although not past presidents, received awards for outstanding work done for the concrete pipe industry. They were H. X. Eschenbrenner, Universal Concrete Pipe Co., Columbus, Ohio; A. M. Hirsh, Sr., Lock Joint Pipe Co., East Orange, N. J.; and Tom Sherman, Sherman Concrete Pipe Co., Knoxville, Tenn.

Luncheon

The noon luncheon was for both men and the ladies. The speaker was Howard Briscoe of the British Concrete Pipe Affiliates, London, England—according to the program. Actually the speaker was a professor (with a British accent), of New York University. His subject was, "A Continental Looks at American Industry."

"Merriman" Cement

The final speaker for the session was N. T. Stadtfeld, division engineer, Board of Water Supply, City of New York, N. Y., who spoke on "Better Cement—More Economical and Durable Pipe." The first two words in Mr. Stadtfeld's talk encompassed much of what the speaker had in mind—namely, better cement. He said that water highly satisfactory for human consumption could be harmful to some concretes because of its high carbon dioxide content due to the ability of such water to absorb CO_2 and bring its pH below 7. His talk was interlaced with humor to a high degree. He outlined the qualities of "Merriman" cement, since it was this type of cement that he was using.

Pipe Specifications

Mr. Stadtfeld devoted some of his speaking time to reading the Board of Water Supply's specifications for concrete pipe. He did this mainly because producers in the New York area wanted other pipe manufacturers to know what they were up against.

The speaker described the various methods of making concrete pipe, including prestressed reinforced concrete pressure pipe.

Mr. Stadtfeld mentioned that successful results were obtained from cements meeting the Merriman specifications, and described the sugar test for determination of degree of burning of cement clinker. This test and the specifications were covered in articles published in ROCK PRODUCTS.

Officers

E. H. Fox was re-elected president of the American Concrete Pipe Association. Other officers are, vice-presidents: Hugh P. Ford, Eugene Concrete Pipe & Products Co., Eugene, Ore.; Harry Leulliette, Universal Concrete Pipe Co., New York, N. Y.; George W. Black, Black-Brollier, Inc., Houston, Texas; secretary, R. L. Bearss, Independent Concrete Pipe Co., Indianapolis, Ind.; and treasurer, J. D. Mollendorf, Continental Concrete Pipe Co., Chicago, Ill.

Directors are Harry W. Heath, Lock Joint Pipe Co., East Orange, N. J.; J. A. Dunn, Hume Pipe Co. of New England, Inc., Swampscott, Mass.; Earl H. Eby, Elk River Concrete Products Co. of Montana, Helena, Mont.; G. F. Lillie, Platte Valley Cement Tile Mfg. Co., Scottsbluff, Neb.; Ivy H. Smith, Sherman Concrete Pipe Co. of Florida, Jacksonville, Fla.; H. A. Wiegand, United Concrete Pipe Corp., Baldwin Park, Calif.; Claude J. Kelly, New Orleans Cement Products Co., New Orleans,

(Continued on page 193)

A.C.I. MEETING IN SAN FRANCISCO

By E. L. HOWARD*

THE CITY BY THE GOLDEN GATE was host in February to the members of the American Concrete Institute and their friends. Five hundred and seventy-one persons registered for the three day meeting. The A.C.I. is noted for its hard working delegates and this convention was no exception. The hosts, however, had arranged entertainment for all registrants and the result was a good balance between work and play.

The opening session on Tuesday, February 20, was devoted mostly to committee reports on revision of standards. President Frank H. Jackson presided over the session. The A.C.I. Building Code was changed to allow the use of a new style deformed reinforcing bar. Raymond C. Reese, chairman of Committee 315, reported proposed changes in bar designations to agree with the changes in the bond values of the new style deformed bars. Frank Kerekes, who reported the building code changes, had with him several samples of the new bar which were studied by many with great interest.

H. F. Clemmer, chairman of Committee 617, detailed the proposed changes concerning pavements and bases. New recommended practices for placing and mixing shotcrete were proposed by Committee 805. W. H. Price presented the last paper in the morning session, Tuesday, pointing out factors influencing concrete strength. He displayed numerous slides showing the use and effect of cement brands, moisture, temperatures, etc.

The afternoon session was presided over by Harmer E. Davis, general chairman of the convention committee. Each of the papers concerned design. In the absence of R. R. Martel, Prof. A. L. Miller gave Mr. Martel's paper on the analysis of earthquake effects. A paper by Charles S. Whitney, Boyd G. Anderson and Mario G. Salvadori, explained a new method for the design of structures under dynamic loading which is applicable to earthquake design. John J. Gould described the design of quake resistant buildings under the strict San Francisco building code. The buildings described were the Metropolitan Life Insurance Co.'s 11 apartment buildings (13 stories each) in San Francisco's Park Merced.

California's first attempt to build a prestressed bridge was described in a paper by Stewart Mitchell of the State Highway Bridge Department. He pointed out the need for design and specification information before a great deal of this work can be done. F. N. Hveem illustrated his talk with some interesting slides depicting the movement of concrete pavement due to heat, cold, and loading.

Tuesday evening should be long remembered by many of the visitors to the convention because of the sightseeing trip through San Francisco's Chinatown. The trip was primarily arranged for the ladies but many men went along.

Wednesday was the busiest day of the conference. The morning sessions (there were concurrent meetings, morning and afternoon) dealt with design and materials. The papers presented in these sessions will be printed in the *Journal* of the Institute.

R. F. Blanks highlighted the materials meeting with a paper co-authored with J. L. Gilliland dealing with false set in portland cement. This very troublesome problem, he suggested, could be corrected by holding down the grinding temperatures of the cement clinker.

L. G. Farrant reported that using the principle of toy building blocks, a parking garage of 30 units was built in New Orleans. The savings from this type of construction was remarkable. The cost of the garage was $400 per car—a cost well below the national average. The economy resulted from the open flat slab construction. Such methods of saving money were the keynote of the "design sessions."

Myron A. Swayze, first speaker in the afternoon construction meeting, evidenced with slides and discussion that the key to durable concrete pavements was the method of finishing. Finishing should be delayed until the concrete is close to its initial set, was his suggestion. J. A. Murlin spoke concerning the part lightweight aggregates can play to reduce construction costs. In building where weight and head space are important items, and particularly in buildings over five stories high, lightweight aggregates will very likely prove to be a real saving of money and material.

A very timely paper on precast concrete was given by A. Amirikian concerning protective construction against atomic blasts. He pointed out that suitable precast units could be made and stockpiled in places for immediate use in emergency. The precast concrete session was well attended and a growing interest is felt in this type of construction.

Wednesday noon was scheduled for the luncheon meeting. After a fine lunch, Harmer Davis welcomed the visitors, and President Jackson, the presiding officer, made the presentation of the tokens of awards.

The Alfred E. Lindau Award was presented to Charles S. Whitney for his contributions to reinforced concrete design practice.

The Leonard C. Wason Medal for the "Most Meritorious Paper" was awarded to H. F. Thomson for his paper "Specifications Should Be Realistic."

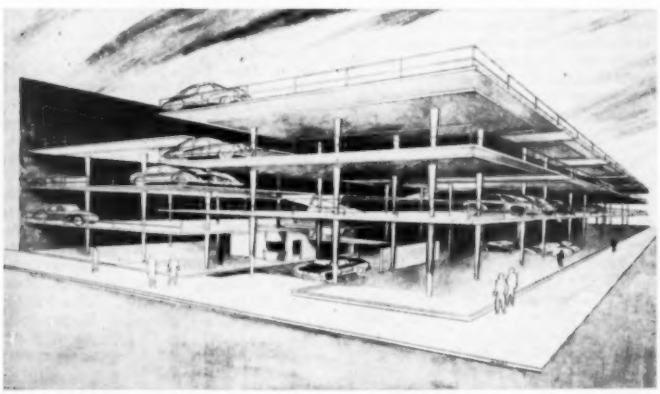
The Leonard C. Wason Medal for "Noteworthy Research" was presented jointly to J. R. Leslie and W. J. Cheesman for their work and paper on "Ultrasonic Method of Studying Cracking in Concrete Structures."

The A.C.I. Construction Practice Award for a paper of outstanding merit on concrete construction practice was given to W. S. Colby for his paper "Design and Construction of a Circulating Water Intake."

To the pleasure of all present, the

(Continued on page 192)

*Pacific Coast Aggregates, Inc., San Francisco, Calif.



These unit buildings, resembling a set of tables resting on each other, were used in a New Orleans parking garage, described by L. G. Farrant and W. C. Harry, consulting engineers, Miami, Fla., at the A.C.I. convention

Displays of Concrete Masonry Equipment

THE LARGE AUDITORIUM in Cleveland was filled with a wide assortment of exhibits and the attendance on each day of the exhibition testified to the value and the popularity of these biannual Concrete Industries Expositions. Almost 75 exhibitors were present . . . so many that some had to overflow into the basement of the hall of the building.

Following is a brief description of all exhibits arranged in alphabetical order:

Adrian Peerless, Inc., Adrian, Mich., displayed samples of "Wal-Lok,"a fabricated steel mesh for use in the horizontal mortar joints of masonry walls.

The American Sta-Dry Co., Brentwood, Md., showed samples of cement paints and waterproofing compounds. A visual demonstration included a well, or tank, filled with water; the tank was made of concrete masonry units which had been treated with the company's products.

Basalt Rock Co., Inc., Napa, Calif., had an excellent exhibit built around demonstrations of "Strestcrete" prestressed concrete and its applications. The exhibit included 3-in. and 6-in. floor slabs, bridge girders, and roof segments. A wall unit encased in 8-in. steel channel irons excited particular attention because of its obvious construction advantages. The wall units, or panels, used 8-in. block, mounted vertically with each panel suitably tongued and grooved.

Besser Manufacturing Co., Alpena, Mich., built a one-story structure near the center of the exhibition hall and in it were samples of products made on Besser equipment. The structure was entirely of concrete masonry construction. The building was quite large and afforded ample room for the visitors. Among the items on display were floor filler block, roofing tile and other concrete units as well as descriptive literature and other data relating to Besser "Vibrapac."

Blaw-Knox Div. of Blaw-Knox Co., Pittsburgh, Penn., featured one of its "Hi-Boy Lite-weight truckmixers" and displayed pictures of the "one package" Blaw-Knox material handling assemblies for concrete block and ready-mixed concrete operators.

Bucyrus-Erie Co., South Milwaukee, Wis., booth featured its mobile "Hydrocranes" for concrete masonry handling jobs. The exhibit included color transparencies and literature relating to the use of this type of crane for installing concrete masonry roof girders, floor beams, floor and roof slabs and similar applications.

The Burbard Clapboard Machine Sales Co., Hamburg, N. Y., had one of its machines for making "clapboards" of concrete on exhibition. This type of concrete unit resembles so-called "ship-lap" or "drop-siding" and can add beauty to residential construction.

Burns and Russell Co., Baltimore, Md., had a wall section comprising the company's "spectra-glaze" structural units. Two types of colored glazed block were demonstrated: one was called Textural Face, type A, and it retains the natural texture of the base block in high gloss, or satin finish. The second type was the Tile Face of type B and it had a uniformly smooth surface either in high gloss or satin finish.

Butler Bin Co., Waukesha, Wis., featured a picture of typical installations of its bins and batchers in use in various concrete processing plants.

Calcium Chloride Association, Washington, D. C., showed literature stressing the uses and advantages of calcium chloride in concrete and cinder block.

The Carnegie Body Co., exhibited a Ford truck chassis equipped with a Thornton powered tandem drive.

The Cedar Rapids Block Co., Cedar Rapids, Iowa, showed typical examples of the use of Dur-O-Wal, a steel wire or rod assembly for masonry wall reinforcing. The demonstration showed how the straight rods and cross rods were used in horizontal segments of the wall to add lateral strength to the structure.

The Celocrete Division of the Celotex Corp., Chicago, Ill., displayed literature and samples of its aggregates for use in the manufacture of lightweight concrete masonry construction units.

Chain Belt Co., Milwaukee, Wis., devoted a considerable area to its colorful exhibit that included two Rex "Adjusta-Hite, Moto-Mixer," ready-mixed concrete haulage units. Several interesting color transparencies were also shown.

Cleveland Vibrator Co., Cleveland, Ohio, had on view a small steel bin equipped with one of its air vibrators that was designed to prevent "hang-ups" in a bin. Several examples of other types of vibrators were also shown, including vibrators for quick attachment to concrete masonry forms and types for use when unloading bulk portland cement.

The Clipper Manufacturing Co., Kansas City, Mo., had a working unit of its 1951 model of masonry saw including cut sections of masonry concrete block units. Also were included circular emery and carborundum-type saws for use on the clipper units.

Columbia Machine Works, Vancouver, Wash., had on the floor one of its fully automatic block machines which was periodically operated to demonstrate the control features that were built around electronic devices. The machine uses electronically operated valves controlled through a panel mounted above the offbearing rolls. The panel had three dials, and allowed 4 to 6 min. per cycle. No. 1 dial controlled the period of time the feed drawer is over the mold box. Dial No. 2 controlled the number of times the feed drawer oscillates over the mold box. No. 3 dial controlled the compression time. The exhibit attracted considerable attention.

The Commercial Shearing & Stamping Co., Youngstown, Ohio, had samples of cored steel pallets and data relating to its line of hydraulic hand pumps, and descriptive literature showing how these pumps could be used as power sources on fork lift trucks, scoop-type mechanical loaders and other equipment for varied industrial uses.

The Concrete Machinery Co., Hickory, N. C., had an attractive display of concrete cast stone ornamental items with emphasis on lawn fixtures. This company stresses molds for this type of concrete masonry work.

Concrete Manufacturer, in its booth, displayed representative samples of its publication.

Concrete Products and Rock Products exhibited samples of their publications that serve the concrete masonry and ready-mixed concrete industries.

Concrete Publishing Co. had a booth in which were shown representative issues of its publication.

The Concrete Transport Mixer Co., St. Louis, Mo., featured one of its "Hi-Lo" truck mixers. It had descriptive literature relating to its "Hi-Lo" and "Hi-Lo Jr." The latter unit is designed to carry up to 3 cu. yd. on a single axle truck.

The Consolidated Boiler Corp., Boston, Mass., had a working unit on the floor of its steam heat generator that is automatic and designed for efficient and economical curing of concrete masonry units. Descriptive literature was also available.

The Construction Machinery Co., Waterloo, Iowa, displayed for the first time its ready-mixed concrete transport unit. Also, in its booth were full sized units of its masonry saw, "Wonder" mixers, a small skip hoist and a gasoline driven "Jet-Crete" gun.

Cook Brothers Equipment Co., Los Angeles, Calif., had a 5-cu. yd. Challenge transit mixer mounted on Ford chassis as the feature of its exhibit. Descriptive literature also was available to the visitors.

The Corflor Machinery Division, Permacrete Products Corp., Columbus,

Ohio, had on view full scale samples of its precast floor and roof construction units and descriptive literature relating to these products.

Dumperete Division, Maxon Construction Co., Inc., Dayton, Ohio, displayed models and pictures of its line of concrete haulage units.

Erickson Power Lift Trucks, Inc., Minneapolis, Minn., had one of its Model F-5-S lift trucks on the exhibition floor and descriptive literature covering its fork and platform power-lift trucks.

Fleming Manufacturing Co., Inc., St. Louis, Mo., had on display a full-size operating unit, its FMC "400" tamper.

Forney's Inc., Manufacturing Division, New Castle, Penn., showed one of its compression testers and had available descriptive literature covering compression test machines in two sizes and up to 350,000-lb. compression capacity.

Gardner Machine Co., Beloit, Wis., displayed a cut-away section of "Wire-Lokt" abrasive wheels showing their construction. Literature described its line of abrasive products and its flat surface grinders.

General Engines Co., Inc., Gloucester City, N. J., featured what it described as its "no pallet" block machine, using instead what it refers to as racks. The machine is automatic and this includes stacking of the racks so a fork lift truck can take them away, thus eliminating much of the off-bearing labor. The machine is said to have a capacity of 1200 block per hour.

The F. C. George Machine Co., Orlando, Fla., had on the floor a working model of its "Presspac" series "400" which was demonstrated at frequent intervals. Florida orange juice was served to visitors at this booth.

The Heltzel Steel Form & Iron Co., Warren, Ohio, had a steel model of a modern ready-mixed concrete batching plant, complete with track, and unloading facilities for both portland cement and aggregates. Many large color transparencies added to the attractiveness of this exhibit.

The Jaeger Machine Co., Columbus, Ohio, had a transit mixer on the floor, one of its 3 HM-C truck-mixers equipped with a 4¼-cu. yd. agitator. Literature was also available, describing the "Hi-dump" truck mixers which included four models up to 5½-cu. yd. mixer capacity.

The Kent Machine Co., Cuyahoga Falls, Ohio, had several of its major products on the floor and these included the Kent standard blockmaker, its continuous automatic "Flomaster" and one of its Lintelators for machine production of precast concrete lintels. The continuous mixer attracted much attention.

The Klingelhofer Machine Tool Co., Westfield, N. J., demonstrated one of its automatic bar-bending machines for forming reinforcing steel for concrete work.

The Truck-Man Division of the Knickerbocker Co., Jackson, Mich., had on exhibition one of its late models of gasoline-driven fork trucks, including a loaded rack of concrete masonry units. Literature describing its "Truck-Man" in three models was also available.

Kwik-Mix Co., Port Washington, Wis., and C. S. Johnson Co., Champaign, Ill., both affiliates of Koehring Co., Milwaukee, Wis., devoted considerable space to illuminated color transparencies showing the general features of many of its products. On the floor, a 10-cu. ft. "Motor Bug" or power wheelbarrow was displayed by the Kwik-Mix Co.

The Lith-I-Bar Co., Holland, Mich., had one of the largest exhibits on the floor with the display built around its three-block, Model L-5, fully automatic block machine. This unit can make three standard 8's on plain pallets. Sound-moving pictures in color were shown of the machine in operation. The company also displayed its block splitter, lintel mold, and "Lith-I-Bar" hydrator and other items of interest to the concrete masonry industry.

Littleford Bros. Inc., Cincinnati, Ohio, had for demonstration one of its "kwik-steam" vapor generators. It was rated at 40 b.hp. (model 1000 EE.)

The Master Builders Co., Cleveland, Ohio, had a colorful display calling the visitors' attention to its many products. A considerable amount of descriptive literature was available describing the company's many products.

Medusa Portland Cement Co., Cleveland, Ohio, had an attractive booth with descriptive literature themed at the company's many kinds and types of portland cement, with emphasis on its "Medusa" white portland cement.

The Mishco Corp., Miami, Fla., had an Appley-Yellen, "Hi-Speed" concrete block machine on exhibition. This unit is designed for automatic and semi-automatic performance. In operation, the machine vibrates the mold and cores and uses a forming head to give a uniform product.

Sam Mulkey Co., Kansas City, Mo., had on display models of portable elevators and conveyors. Because of the unit's design it was of considerable interest to the concrete masonry industry; the elevator could find many uses for handling (or stacking) concrete block and similar bulk or packaged handling work. The conveyor can be extended in length if desired. Literature was available showing the unit at work on concrete block construction jobs.

Multiplex Concrete Machinery Co., Elmore, Ohio, devoted considerable area to a complete block plant featuring "Block Master." Damp sand was mixed in one of the company's 30-cu. ft. mixers and the material made into a structural unit of the "Block Master." The exhibit attracted a greal deal of attention.

The National Concrete Masonry Association had two wall exhibits in the basement of the exhibition hall. Literature and other data were available pointing to the activities of N.C.M.A. and the work the association is doing to help the individual members of the association.

The Gene Olsen Corp., Adrian, Mich., had an informative display of considerable size built around the "Gocorp Sr." Also on the floor were its "Gocorp Jr." twin mixers and related concrete masonry fabricating units. Literature was available describing these units including the Gocorp "King," an automatic machine able to make six standard 8's per cycle —3 to 4 min. per cycle, using plain pallets. The company also had on display a plastic model of its "Supremix," premix concrete hauler that is known to the trade as "SuPremix," an affiliate of the Gene Olsen Corp.

The Oswalt Engineering Service Corp., Forest Park, Ill., had in its booth literature describing its service to Vibrapac owners. This service is aimed at speeding up production of that type concrete block manufacturing unit, which involves a conversion.

The Portable Heater Co., Cleveland, Ohio, had one of its portable heaters using butane fuel. The fuel is contained in a 20-lb. cylinder with the whole assembly weighing 55 lb. The portable heater is designed for heating buildings under construction and in concrete masonry curing work.

Praschak Machine Co., Marshfield, Wis., had on view its 1951 model "400" block machine and a 21-cu. ft. mixer, as well as a hand lift truck for intra-plant rack transportation of concrete block.

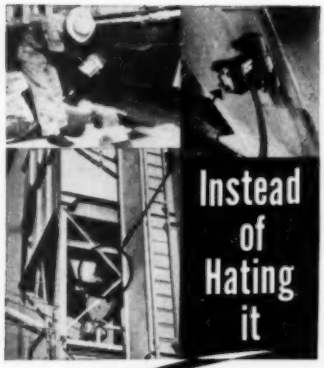
The Prime-Mover Co., Muscatine, Iowa, showed its Bell Prime-Mover, a 101-cu. ft. rubber mounted, gasoline-driven "buggy" or wheelbarrow designed for transportation of concrete on construction jobs and for intra-plant handling of aggregates going into the manufacture of concrete block and other concrete products.

The Ransome Machinery Division, Worthington Pump & Machinery Corp., Harrison, N. J., had considerable floor space devoted to a Ransome "Blue Brute," 4½-cu. yd. transit mixer operatable as a 6¼-cu. yd. agitator. A gas-driven, rubber-mounted, self-priming pump, and an assortment of concrete placing hand tools, pneumatically operated, were on exhibition. Literature and moving pictures were also available showing the diversified line of equipment this company has to offer to the concrete masonry industry.

Arthur Rehberger and Son, Inc., Newark, N. J., had one of its concrete block unloaders mounted on an International, Series L-190, truck chassis. This device is intended for unloading

(Continued on page 188)

MACHINERY EXHIBITION



Start Vibrating It!!

. . . With Cleveland Air vibrators, like the Type LSRR and F, shown at work herewith.

It's easy to just get mad and say what's the use, but it's a lot easier to let these twins shake it loose.

They are double trouble-makers for your double-tough materials. They're doing a round-the-clock job in a lot of plants like yours.

The LSRR is equipped with a cast steel male bracket which fits the female bracket that is standard equipment on most covered hopper railroad cars. Easily adapted to hoppers, bins, chutes, flasks, mine cars, etc.

The F is made in six sizes for bins containing from one to several hundred tons. The F will call a halt immediately to arching, plugging, and sticking. As shown, simply mount the vibrator on the skin of the bin, using a reinforcing plate. Type JN lever-type valve and automatic lubricator insure efficiency. Catalog No. 105 gives further detail.

THE CLEVELAND VIBRATOR COMPANY

2713 Clinton Ave. • Cleveland 13, Ohio

concrete block from a truck and to do it quickly and cheaply. The unloader was a part of the exhibition in the basement of the auditorium.

Rox Cement Paint Co., Detroit, Mich., had on display samples and demonstrations of the use of its inorganic cement base paint for use on concrete masonry surfaces. The paint is designed to seal cracks, prevent water seepage, and is a decorative and protective coating.

O. H. Smith Co. had on the floor a Reo E-226 truck chassis carrying a 4½-HMC, Jaeger mixer body. The Reo E-226 is provided with a 140-hp. "Gold Cornet" gasoline engine. It is a tandem axle job provided with Timken bearings with exhaust valves, sodium cooled, stellite faced. The exhibit was co-sponsored by the Reo Motors, Inc., Lansing, Mich.

The T. L. Smith Co., Milwaukee, Wis., had two Smith-Mobile mixers on the floor and pictures spotlighting the advantages of its ready-mixed concrete haulage units.

The Solvay Sales Division, Allied Chemical and Dye Corp., New York, N. Y., had descriptive literature relating to the use of calcium chloride in concrete masonry block manufacture.

Split Rock Products, Milwaukee, Wis., had a working model of an air-operated guillotine for splitting concrete masonry units. The primary purpose of the "Buster" is to expose a face of relatively uneven texture so the block can be used for decorative purposes. The machine on the floor was designed for splitting standard 8's (or smaller) units.

Spray-O-Bond Co., Milwaukee, Wis., in its booth featured its concrete plasticizer and other concrete restoration products such as "Hydro-check," designed to stop active leaks, anti-freeze for portland cement mixes, sealers, hardeners, and related products.

Standard Dry Wall Products, Inc., New Eagle, Penn., demonstrated the use of its line of materials designed for sealing the interior and exterior of concrete masonry surfaces. Those lines on exhibit included "Waterplug" to stop leaks, "Thoroseal" to fill and seal the surface, and "Quickseal" which is said to have the further quality of adding beauty and attractiveness to concrete masonry walls.

The Stearns Manufacturing Co., Adrian, Mich., devoted a large amount of floor space to an exhibition of the company's line of concrete block machinery. This included a Stearns No. 50 and a No. 15 unit as well as the Stearns Tipper. A yard crane was also on display and a historical note was added by having a 1932 "Joltcrete Jr." on view.

Supremix, Inc., Adrian, Mich., an affiliate of the Gene Olsen Corp., had a plastic model of its concrete delivery body and descriptive literature relating to modernization of batching plants by converting to a premixed operation. Nearby, the Clifton Coal & Supply Co., a local concern, had a "concrete hauler" mounted on a Ford chassis.

The Towmotor Corp., Cleveland, Ohio, displayed one of its fork lift trucks equipped with a Schmidgall fork for handling pallet and packaged items.

The Transmission & Gear Co., Dearborn, Mich., showed its "Transco" truck mixer drives. On the floor was a model MH 4-51, a replacement transmission for all models and sizes of Blaw-Knox, Jaeger, Smith, Rex and Ransome mixers, and a MH 45-D-50 model for older models of Jaeger transmissions.

The Twinwall Co., Minneapolis, Minn., showed examples, and gave out literature describing a Twinwall block that is designed to eliminate the necessity of lathing or furring a concrete masonry wall. The block was designed so that it can be made on Besser, Gocorp, Stearns and other high production machines.

The Tayler Williams Laboratories, Stanton, Mich., devoted space to the services it had to offer to the concrete masonry industry.

Universal Door Carrier, Inc., Indianapolis, Ind., exhibited one of its "Uni-Temp," all-aluminum lightweight doors for use on concrete masonry curing kilns.

The Universal Manufacturing Corp., Zelienople, Penn., showed models of its tubular, sectional steel scaffolding and had literature available describing these and related items.

The White Motor Co., Cleveland, Ohio, showed one of its late model truck chasses, carrying a Rex (Chain Belt Co.) "Moto-mixer."

The Yale & Towne Manufacturing Co., Philadelphia, Penn., had on view one of its Lift-All, hydraulic fork trucks. It also displayed a specially-designed steel rack for racking concrete masonry units. It was designed to enable the user to place loaded pallets on the rack without interference from upper construction members.

The Yoder Co., Cleveland, Ohio, had a corner exhibit in which was attractively displayed its continuous mixer designed for concrete block production, and its compression block tester. This unit is a 100-ton hydraulic, hand-operated, test unit. Descriptive literature was also available.

New Association

MO-KAN CONCRETE PRODUCTS ASSOCIATION is a newly formed organization of producers in Kansas City, Mo., for the improvement and promotion of concrete products. The officers are George W. Goelitzer, president; George W. Kulhavy, vice-president; L. L. Daugherty, secretary, and Gus Main, treasurer. The executive committee is composed of the officers and C. E. Swanson, John Slaton and Dale Williamson. An executive secretary, F. T. Brown, has been appointed to handle office matters from headquarters at 311 West 51st Terrace, Kansas City, Mo.

STOP, JOE! I'll Make That Cut In 5 SECONDS with my CLIPPER MASONRY SAW and make it perfect, too!

Yes, any cut—ON ANY MATERIAL—made in seconds and at amazing low cost. No material is lost from chipping or fractures. Imagine!—One operator and one saw will do the work of 15—or even 25 men equipped with hammers and chisels. And..

CLIPPER FREE TRIAL

Guarantees—ACTUAL TEST ON THE JOB—FULL SATISFACTION..NO OBLIGATION. The outstanding policy of FREE TRIAL has been in effect since Clipper invented the world's first masonry saw years ago. Try it now!

NINE MODELS TO CHOOSE FROM PRICED FROM $265.00

Any Material ...On Any Size Job

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PATENTED CLIPPER FEATURES

1. Makes your blades last longer... Because Equalizer Spring automatically cushions blade pressure whether cutting HARD or SOFT materials. Outstanding for blade economy.
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3. Just turn the Save-A-Blade Dial to the material hardness and the pressure Equalizer Spring automatically sets the tension—guarantees faster cutting and longer blade life.
4. Pull the knob—and the Cutting Head is free for finger-tip setting at any desired angle. Release the Knob—and Head is locked in the desired position.

Even on the smallest masonry jobs a Clipper will pay for itself! Brick, Concrete Block, Glazed Tile, Natural Stone—regardless of hardness—they're cut with smooth simplicity. And with the MODEL HD you can choose your cutting method—cut Wet (DUSTLESS) in confined areas or switch to Dry for outside operations. Remember too, there are Nine Clipper Models designed for your job and cost problem.

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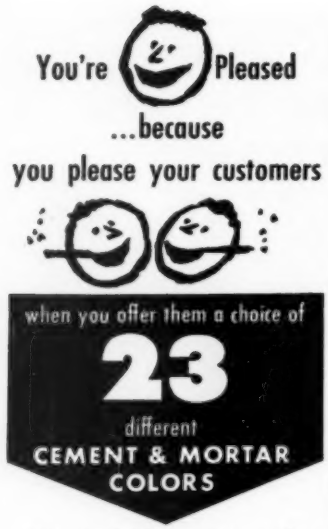

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Here you have a choice of 18 shades—6 Reds, 3 Greens, 3 Browns, 3 Yellows, 1 Black, 1 Blue, and 1 Orange. Each shade is manufactured to meet the most exacting specifications for cement work—as recommended by the American Concrete Institute and the Portland Cement Association.

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Here you have a choice of 5 different shades—one shade in double strength red, light buff, dark buff, chocolate and black. Each of these colors may be used with excellent results with any standard mortar mix or with a ready-made Bricklayer's Cement.

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NEW MACHINERY

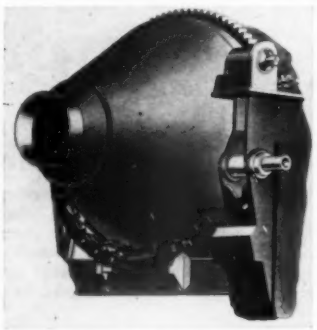
Mobile Plant

MIXERMOBILE MANUFACTURERS, Portland, Ore., has announced an improved model of its 2-cu. yd. Mixermobile M-7, which is a complete mobile concrete mixing and elevating plant. The unit is equipped with a hydraulically operated self-loading skip for receiving batched aggregates from dump trucks, portable batching plants or front-end loaders. Folded for traveling, the machine is 33 ft. long, 12 ft. high, weighs 24,000 lb. and has a standard 34-ft. steel tower, with 10-ft. extensions available.

Concrete mixing and elevating plant

Tilting Mixer

SUPREMIX INC., affiliate of Gene Olsen Corp., Adrian, Mich., has announced its tilting mixer which is claimed to be an outstanding piece of equipment for new plants and those converting from dry batching to central mixing. According to the manufacturer, the plant is of versatile design, allowing for two lines of traffic, one for central mixing and one for dry batching, using the same scale and batching facilities. Ease of conversion can be accomplished without raising present bin structures or depressing driveways, and no collecting hopper is necessary, as the mixer tilts directly into the delivery equipment. The power source is outside the mixing frame, thus allowing for diesel, gasoline or electric power.



Unit for central mixing

Fork Load Shifter

ERICKSON POWER LIFT TRUCKS, INC., Minneapolis, Minn., has in production a new side-shifter mechanism, available for the forks of all Erickson lift trucks. This unit enables the operator to shift his fork load 3½ in. either to right or left from the normal center position. This feature is said to be a great time-saver, making it possible to pick up a load and stockpile it without moving the lift truck into perfect alignment.

Truck Concrete Mixer Drive Unit

THE TRANSMISSION AND GEAR CO., Dearborn, Mich., has provided information on a new truck-concrete-mixer drive in which power is coupled directly to the mixer drum through a large universal joint spider and which eliminates heavy ring gears and sprockets normally fastened to the mixer drum. The drum of the new unit couples directly to the secondary gear reduction unit which is driven from the master transmission by a universal joint. Planetary reverse gearing and large spring-loaded clutches, running in oil, give smooth starting and discharge reversing, the manufacturer claims. The unit provides the operator with two discharge and two mixing speeds. The manufacturers also claim a considerable reduction in initial costs as well as in weight savings. The unit is available for any size or model of Blaw-Knox, Smith, Jaeger, Rex, or Ransome mixers. It can be purchased with a fluid coupling or with manufacturer's own make torque converter. Operator's choice of engines can also be provided.

Drive unit for truck mixers

Automatic Block Machine

COLUMBIA MACHINE WORKS, Vancouver, Wash., has developed several new products: the electronic automatic block machine, a mixer, a pallet oiler and cleaner and an electronic Columbia Model 8.

The block machine is said to permit flexible control of each movement throughout the cycle, can be switched from automatic to remote control, or may be switched off for manual operation. The Columbia mixer has rubber liners which are said to be for longer wear, and five sizes are available.

Asks Rezoning of Property

RALPH FILISKY, Decatur, Ill., who has leased a tract of land from Decatur Sand and Gravel Co., for the purpose of erecting a concrete block plant, has filed a petition with the county zoning administration requesting a rezoning of this property from agricultural to light industrial. Mr. Filisky stated he wants to operate on the company property so as to be close to raw materials for his product. Only sand and gravel operations are carried on there at the present.

T-V Sells Concrete

CONCRETE MASONRY MANUFACTURERS ASSOCIATION, Los Angeles, Calif., is presenting a series of programs entitled, "A Home to Live In," as a means of promoting the sale of concrete masonry products. This is the first time that television as a means of advertising has been used in the rock products industry—at least the first that has come to the attention of the editors of ROCK PRODUCTS.

The programs are being televised weekly over Station KLAC-TV, Channel 13, for 26 weeks, beginning last February 25.

Manufacture of Equipment for Lightweight Aggregates

LIGHTWEIGHT AGGREGATE EQUIPMENT CO., Marietta, Ohio, was recently organized to design, manufacture and erect equipment for complete lightweight aggregate plants for the production of "Beslite."

Beslite is a new lightweight aggregate and is produced by a special process for attaining high quality and a high rate of production. It may be used in making all types of concrete building products and may be manufactured from clay, shale and various other raw materials.

The new company was formed jointly by The Marietta Concrete Corp., Marietta, Ohio, producer of concrete silos and other concrete products, and Besser Manufacturing Co., Alpena, Mich., manufacturer of machinery and equipment for the concrete products industry. The Marietta company is also a producer of the lightweight aggregate. It has locally produced "Aglite" since 1948.

Directors and officers of Lightweight Aggregate Equipment Co. include F. L. Christy, Marietta, president and a director; J. H. Besser, Alpena, director; Elroy C. Bobolts, Alpena, vice-president, general manager and a director; R. Neil Christy, Marietta, secretary and a director; and Marx P. Rosenthaler, Alpena, treasurer. Ernest H. Tresch, air pilot for The Marietta Concrete Corp., will also serve the new company as a contact and field service representative. The organization is planned to be international in scope, and executive and sales offices are maintained in the First National Bank Building at Marietta.

WHICHEVER WAY YOU LOOK AT IT_
HELTZEL BUILDS IT BETTER
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BUILDS IT BETTER
On every point of comparison Heltzel batching plants are better built. Engineered for the operator to give maximum production at lower cost. Constructed for trouble-free service and long life. Write for complete information.
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CHALLENGE... challenges the field
FOR RAPID DISCHARGE OF
LOWEST SLUMP CONCRETE

Ask the men who operate Challenge Mixers...Mr. Harry Bender, President of Azusa Rock and Sand Co., Azusa, California, for instance, who says: "Our Challenge Mixers easily and quickly discharge lowest slump concrete. You couldn't ask for better performance." And, here's why: 1. **Two continuous type "L" shape mixer blades**, working as a team with the exclusive Challenge "dam" in the discharge cone, push the concrete out in "double quick" time. 2. **Angle of inclination** on the Challenge is only 14°. 3 **The big 34"** discharge opening is completely free of obstructions...nothing to hinder or hold back the concrete.

But don't take our word...your Challenge dealer has a demonstrator you can use in your own plant on your own job. Make your own comparison under actual operating conditions...you be the judge.

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Please send me a copy of your new Catalog No. 1-51 together with the name and address of my nearest Challenge dealer.
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ROCK PRODUCTS 309 W. Jackson Blvd. Chicago 6, Illinois

A.C.I. Meeting

(Continued from page 184)

announcement was made of the election to honorary membership of Harrison F. Gonnerman and Frank E. Richart. Alan Bates accepted the honor for Mr. Gonnerman, who was absent, and Prof. R. E. Davis accepted the honor for Mr. Richart, who was absent because of ill health. Each spoke for a few minutes on the fine contributions the honored men had made to the art and practice of concrete construction.

J. E. Jellick, spokesman for the tellers, announced the election of Harry F. Thomson as president of the institute for 1951. Mr. Thomson is manager of the ready-mixed concrete division, Material Service Corp., Chicago, Ill. Henry L. Kennedy was elected vice-president for a term of two years. Announced also were the elections of members of the board of directors: Frank Kerekes, G. L. Lindsay, I. E. Morris and Walter H. Price. These officers will serve three years.

The retiring president addressed the luncheon gathering, which is the yearly custom. He expressed his appreciation for the help and confidence of the members during the past year and held forth an optimistic future for the institute and the concrete industry.

The entertainment committee, headed by Jay Jellick, arranged for a dinner party Wednesday evening. This and other entertainment features were with the compliments of the concrete and building industries of the far west. Three-hundred and fifty or more members attended the dinner, which was very successful and which was highlighted by an after-dinner speech by Paul Gros. Harmer Davis acted as the master of ceremonies.

Thursday was given over to informal papers and panel discussions. The attendance at these meetings was good and the "off the cuff" discussions answered many of the questions and problems concrete industry men face each day.

To top off the convention for the visitors, Mr. Jellick's committee took them on a cruise of San Francisco Bay. The group headed westward toward the Golden Gate just as the sun was dipping into the Pacific, a memorable sight. The swing around the bay provided a panoramic view of San Francisco's famous skyline.

Much credit for the success of the convention should go to the program committee and its chairman, Prof. Joe Kelly. The expenses of the meetings and entertainment were handled by the finance committee, whose chairman is A. G. Streblow. The splendid attendance reflects the work of W. A. Marsh and his committee. J. E. Jellick and his committee on entertainment did an excellent job proving that San Francisco is a "friendly city" and a nice place to visit. Thanks to Lee Rothgery and his group, the meetings

were orderly and properly housed. Several fine pictures representative of concrete work in the far west were exhibited and were provided by Michael Goodman and James Hirst. J. I. Ballard had the duty, with his committee, to publicize the meetings —a job well done.

Pipe Convention

(Continued from page 183)

La.; Thomas E. Arp, Sherman Concrete Pipe Co. of Knoxville, Inc., Knoxville, Tenn.; and G. D. Williamson, Valley Concrete Pipe and Products Co., Yuba City, Calif.

The executive committee consists of E. H. Fox, chairman, and J. D. Mollendorf, Hugh P. Ford, J. A. Dunn and Harry W. Heath. The nominating committee, with H. D. Palmore, chairman, consists of Dick Carroll, J. W. Porter, Henry C. Eames, and G. D. Williamson.

On Thursday evening a cocktail party and reception was given, at which time the members were the guests of the Lock Joint Pipe Co. and Universal Concrete Pipe Co. On Saturday, a cocktail party and reception was held with members the guests of the manufacturers of welded wire fabrics. A banquet followed this reception.

The ladies were conducted on a tour of the city of New York and also attended the noon luncheon on the final day of the convention.

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Meeting Load Limitations with high capacity

..at LOW COST

- **Rugged Construction**
- **Light weight & Speed**

The HI-LO and HI-LO Jr. TRUCK MIXERS embody the Revolving Blade Mixing (kneading, folding, blading) — and VISIBLE MIXING ACTION so popular for the past 20 years.

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Look For the Rating Plate

You See ALL THE ACTION

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End Your Unloading Problems with the **NATIONAL CAR SHAKER**

The National Car Shaker is a low cost unit, easily handled by one man. It will unload 50 tons of sand, gravel, cinders, stone or similar materials in a matter of minutes, eliminating the bottle-neck at your car unloading point. Keeps your handling equipment operating at full capacity. National Car Shakers quickly pay for themselves in labor savings. A simple jib crane or monorail can be furnished for handling the shaker.

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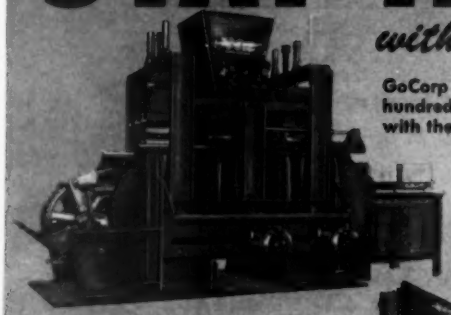
STAY IN FRONT

with really modern equipment

GoCorp hydraulic block machines have proven in nearly one hundred plants that better block can be made—at a lower cost—with these modern machines.



GOCORP "JUNIOR"

Vibrator machine . . . uses cored pallet . . . 3 to 8 eight inch block per minute . . . low price . . . easily installed.

GOCORP "SENIOR"

12 or more eight inch units per minute . . . other features same as "King."

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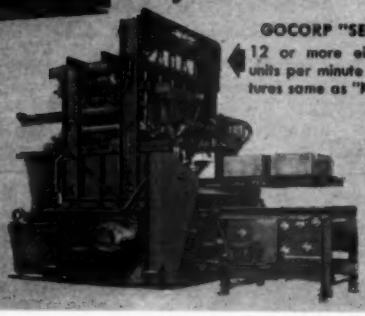
Completely automatic . . . 18 to 24 eight inch units per minute . . . plain pallets . . . front feed.

Also "GoCorp Prince" plain pallet two-at-a-time machine; Batch Mixers in five sizes; Pipe and Tile Machines.



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G-231

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GERLINGER CARRIER CO.

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T-H-O-U-S-A-N-D-S of PADDLE STROKES GIVE *Incomparable* MIXING RESULTS— with the KENT CONTINUOUS METHOD

WRITE FOR BULLETINS Describing All 3 *KENT* Continuous Mixers

For better mixing and greater profits all facts favor KENT Continuous mixing.

52 paddles slice, cut over and back turn the aggregate thousands of times in trough of mixer before mix is discharged at a steady flow into hopper of Block Machine.

Through use of variable speed Drive, the Kent Stediflo can be set for any desired amount of mix to suit any production block machine on the market today.

Once adjusted, the machine operates automatically, releasing a man for other profitable work. Less power is required than other mixers effecting sizable current savings.

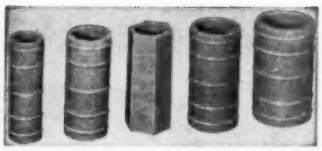
Kent Mixers are easily adjusted to the exact needs of all aggregates.

Kent Stediflo Mixers are serving the largest of block machines with complete satisfaction. Sizes are also adaptable for smaller installations, all operating on the same principle.

The KENT MACHINE CO. Cuyahoga Falls, Ohio

Manufacturers of CONCRETE PRODUCTS MACHINERY *Since 1925*

THE
MARVEL JR.



CONCRETE DRAIN TILE MACHINE

These Marvels are operating daily from Coast to Coast and in Ireland. The Marvel Jr. will put you "over the hump." Ten days normal operation will pay for the machine with profits left over! No plant is complete without a Marvel Jr.
Standard equipment includes either 3-, 4-, 5-, or 6-inch attachments with Heavy Duty Sealed Ball Bearing ¾ H. P. Motor. Attachments are available with which you can make fittings as pictured. We are also the largest manufacturer of Specialty Molds.

Write Today for Complete Information

CONCRETE MACHINERY CO.
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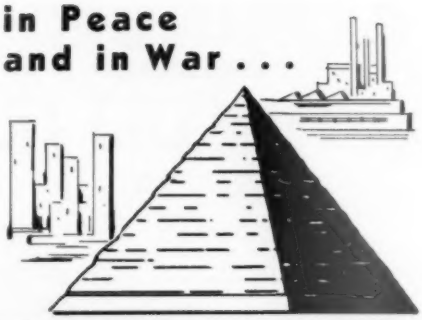
SHAPE FORMER FITTINGS PERMIT YOU TO MAKE THESE

in Peace
and in War . . .



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CHECK THESE ADVANTAGES
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4 SPEEDS FORWARD, 4 SPEEDS REVERSE

Where the going is toughest in unpaved outside yards, there's where Erickson balanced traction shows up best,—even without fork load. It's truly "the Workhorse of Lift Trucks".
The new Side-Shifter saves time picking up a cube or other load, and stockpiling it without jockeying the truck. The new Auxiliary Transmission provides 4 speeds both forward and reverse,—speeds up handling racks in and out of kilns, yard work, etc.

For ease of handling and rugged durability, you can't beat an Erickson Model F-5 (5000 lbs. capacity) or F-6 (6000 lbs.)

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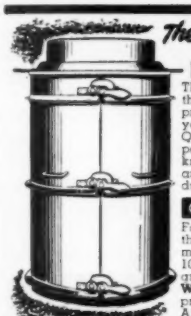

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FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.
WRITE TODAY. Complete information, prices, and estimates sent on request.
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Columbia "FULLY AUTOMATIC" BLOCK MACHINE

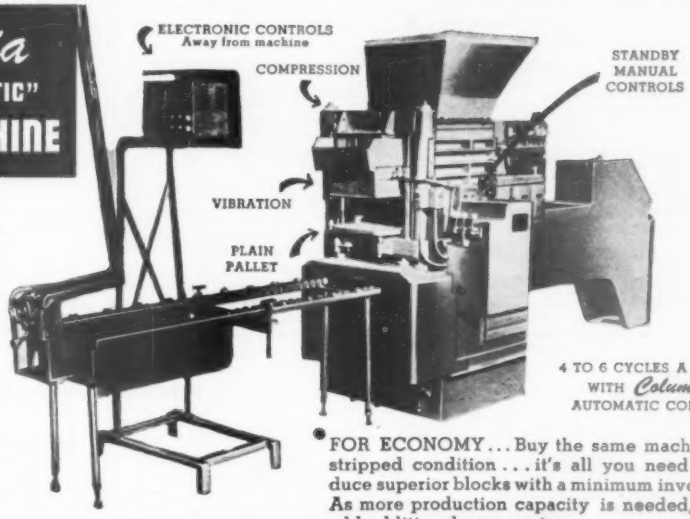
Adjustable Electronic controls give this rugged, dependable, plain pallet machine a flexibility of operation unheard of before in the block industry!

Manual control is not sacrificed...the operator can easily switch from automatic to manual.

The Columbia produces precision blocks at a high rate of speed...it's easy to install and inexpensive to maintain.

Write today for complete information about this LOW COST, high production unit.

FINANCING AVAILABLE.



4 TO 6 CYCLES A MINUTE WITH *Columbia* AUTOMATIC CONTROL

FOR ECONOMY... Buy the same machine in a stripped condition . . . it's all you need to produce superior blocks with a minimum investment. As more production capacity is needed, simply add additional accessories.

COLUMBIA MACHINE WORKS

107 S. GRAND AVE.
VANCOUVER, WASH.

Beautify and Protect Porous Masonry with ONE COAT AGRASEAL

NEW, WATER-REPELLENT BRUSH COAT SEALS PORES OF CONCRETE AND BEAUTIFIES IN ONLY ONE COAT!

- For exterior or interior use on cinder blocks, light-weight aggregate and concrete blocks.
- Better than two or more coats of ordinary cement coatings.
- Fills all voids. No hair checking. No alligator checking. No powdering.
- No expensive equipment needed. Apply with ordinary scrub brush or short bristle paint brush.
- Easy mixing. No lumps. Quickly soluble.
- Easy brushing. Spreads like butter. Cures fast.
- Comes in white and seven beautiful shades of ivory, light buff, grey, cream, green, sunny yellow, brick red. Easy to blend for pastel shades.

Write for details!

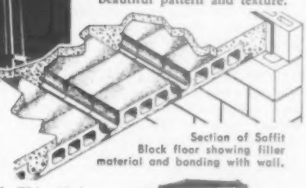
TAMMS INDUSTRIES, INC.
(formerly Tamms Silica Co.)
228 N. La Salle Street, Chicago 1, Ill.

SELL MORE BLOCK ON EVERY JOB!

Furnish VIBRAPAC SOFFIT BLOCK for ALL FLOORS and ROOFS

Permanent, Fireproof Floors and Roofs. Low initial cost and maintenance. Natural base for radiant heat installations. Provide surface of maximum acoustical and insulation value. Can be plastered, or if left exposed, makes a ceiling of beautiful pattern and texture.

Removing Centers from Finished Floor.

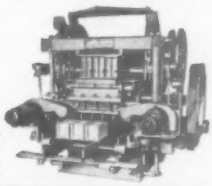


Section of Soffit Block floor showing filler material and bonding with wall.

Soffit Block are supported in place with temporary adjustable steel centers while reinforced concrete slab is placed and cured. This eliminates timber shoring and leaves space below clear during construction.

BESSER VIBRAPAC PRODUCES SOFFIT FLOOR AND ROOF UNITS

The same machine that produces high quality concrete masonry units in all styles and sizes, using Plain Pallets. Continuous, full capacity operation. Fully automatic. No machine operator required.



BESSER MANUFACTURING CO.
ALPENA, MICHIGAN, U. S. A.
Complete Equipment for Concrete Products Plants

A 5867-14R2

CLASSIFIED ADVERTISING

SELL **SWAP** **BUY**

1—No. 9 Stearns Joltcrete
3—8" Mold Boxes excellent condition Prices $3500.00
2—Stearns model A Clippers 750.00 ea.
1—Complete No. 7 Plant 6000.00
2—Kelley 30 Cu. Ft. Mixers 1400.00 ea.
20-Steel Racks ..... 20.00 ea.
4—Hand Lift Trucks ..... $75.00 to 195.00 ea.
1—Fork Lift Pneumatic Tires Hyster 4000 lb. 2300.00
2—Pallet Dunkers ..... 55.00 ea.

Pressed Steel Pallets. All Pallets in perfect condition.

4000— 3" ..... 25c ea.
6000— 4" ..... 35c ea.
8000— 8" ..... 48c ea.
2000—10" ..... 60c ea.
4000—12" ..... 80c ea.

Thousands of steel aluminum and cast iron pallets in stock. Send tracing of your pallet for quotation.

WRITE **WIRE** **PHONE**

GENERAL ENGINES CO., INC.

(Used Equipment Division)

307 Hunter Street **Gloucester City, New Jersey**

Phones Gl. 6-1337 — Gl. 6-1338

We buy complete plants for cash.

FOR SALE

Semi-Automatic Model HK47 Hydro-Korpak Block Machine with 4—6 and 8" attachments.
Dumm Shovel Mixer Model 10 complete with skip hoist and motor.
Two men now making 1900—8" Blocks daily. Both machines perfect. Reason for selling, installing larger machine.
Kent No. 2—5 cu. yd. per hour continuous mixer complete with motor. Brand new never been used still on factory skids.
Quinn Heavy Duty T & G concrete pipe forms for making 5—10": 10—12" and 5—15" pipe 36" long. Complete with shoveling plates and hoppers. Never been used Brand New.

NORCRETE BLOCK CO.
Onley **Virginia**
Phone Onancock 4

FOR SALE

Complete Cinder Processing Equipment
1—40 ft. Portable Conveyor
1—55 ft. Portable Conveyor
1—Vibrating Screen
1—Magnetic Separator
1—Roll Crusher
1—Track Conveyor, motors and all controls.

SAMSON BLOCK COMPANY
E. 9th Street **Lorain, Ohio**

FOR SALE — GOOD BUY

(1) Model No. 9 Joltcrete with Power Carriage
(1) Stearns 28 cu. ft. Batch Mixer
(1) 28 cu. ft. Volume Batcher
(1) Air operated Offbearer
(1) Erickson Fork Lift Truck
(46) Block Racks—Steel—72 block capacity
(3500) 8" Pressed steel pallets including 500 corner pallets
(2200) 12" Pressed steel pallets including 200 corner pallets
(6000) 4" Pressed steel pallets 4", 8" and 12" Attachments with fittings for solid, corner, sash, bullnose and semi-solid units

Above equipment in good operating condition. May be seen at CONCRETE PRODUCTS COMPANY, 28th and Pinard Streets, Dubuque, Iowa. Reason for selling — installing new equipment. Prefer to sell above complete, reasonably priced. Inquire of owner or GoCorp, Adrian, Michigan.

PECKHAM ROAD CORP.
50 Haarlem Avenue
White Plains, N. Y.

EQUIPMENT FOR SALE
Used ¾ Yard Strayer Concrete Mixing Plant 3-Compartment —Electric Motor Located at Port Chester Plant ..$3,500.00
Two (2) Dumpcrete Trucks—2½ Cubic Yard Capacity Mounted on Ford Trucks ..... $1,500.00 each
Located at our Garage:
One (1) Miller No. 491—Model 80-1 Spreader Box with Truck Connections for Sale ..$ 750.00
One (1) Tile Machine—Lampman —with 4", 6" and 8" Molds
One (1) Tile Machine—Quinn—8"
MAKE AN OFFER ON THE ABOVE TILE MACHINES
One (1) Jaeger 10-S Mixer with Le Roi Motor Located at Cairo, New York ..... $ 200.00

FOR SALE

Universal Automatic Block Machine
1700—8" pressed steel pallets
1600—4" pressed steel pallets
Hydraulic Lift Truck
30—56 Block steel racks
16' Dunn Mixer and Hoist complete
All equipment required for a profitable 1200-1600 per shift operation. Installing larger equipment.

Mitchell Concrete Products
Mahomet, Illinois

FOR SALE

Joltcrete No. 9 Block Machine with complete attachments and spare parts . . . good operating condition.

Steel Pallets

for above-listed machine.
6916—4"——5008— 6"
7089—8"——3764—12"
These are good as new.

Racks

50 racks of 96 block capacity. This equipment may be inspected at our Kansas City plant. Subject to prior sale . . . Sale must include all above-listed equipment . . . Write, wire or phone A. R. Waters at

The Carter-Waters Corp.
2440 Pennway, K. C., Mo.
Phone GRand 2570

FOR SALE

Besser Super Vibrapac Plant. Completely modern and doing large business. Located in Minnesota. Reason for selling, poor health. Send replies to Box J-45 CONCRETE PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Ill.

FOR SALE

1—Stearns No. 9 Joltcrete with Power Offbearer and latest attachments
CAN BE SEEN IN OPERATION
Mold Boxes and pressed steel pallets for, 4" — 8" — 12" sizes
50—Steel Racks, 72 block capacity

CRANDALL'S CONCRETE PRODUCTS, INC.
Box 119 **Benton Harbor, Michigan**

FOR SALE

Korpac Block Machine with 8" line mold, 8" Bullnose mold, 4" Bullnose mold, 12 cu. ft. batch mixer, belt conveyor and motors, complete for $1750.00

Box J-27 CONCRETE PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Illinois

ALSO SEE CLASSIFIED ADVERTISING ON OTHER EQUIPMENT IN ROCK PRODUCTS' GENERAL SECTION

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SCOOPMOBILE
Model B, ¾ yd. Cap. Bucket and Fork Lift, 3000 lb. cap.
Good condition
Will sell reasonable.
DALLASTOWN CEMENT COMPANY
DALLASTOWN, PA. Ph. Red Lion 36484

FOR SALE
Barrett Power-Ox electric hand lift, with battery charger. 6000 lb. capacity; 25" wide by 60" long; when lowered 11" from floor, when raised 14". Available now.
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CLARK, 6,000 LB. UTILITRUC
Ready Power Unit.
104" LIFT. SOLID TIRES Block handling Forks. Condition: Good $2000.
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Atlee cement block vibrator, mixer, chimney block machine and 1000 pallets.
Central Massachusetts Perma-Stone Co.
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1 Stearns No. 15 Press Damaged by fire, many salvageable parts.
THE CRUME BRICK COMPANY
P.O. Box 4 Far Hills Sta., Dayton 9, Ohio

CONCRETE BRICK COLORS
CEMENT COLORS
MORTAR COLORS
made by
BLUE RIDGE TALC CO., INC.
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FOR SALE
105—12x3" J & L Light beams 8 and 10 ft. long, flange cut on one edge to 2" width. Used as forms for concrete slabs.
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FOR SALE
Dunbrick machine practically new, and pallets for 6300 brick. Priced to sell.
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FOR SALE
One Unused Automatic color mixer, type FMC-30, Style 4354 and Serial No. F9C103934
D. A. Howe Sons, Inc. 300 South West Cut-Off, Worcester 7, Mass.

1—Electric Lift Truck complete with charger, platform size 21" by 63"
850—8" pressed steel pallets
100—8" pressed steel corner pallets
1—Anchor 8x8x16 Rock Face and plain mould box
1—8" Rock Face and 6 or 8" Water Table mould box, both machines can be used under power tamper
Above equipment priced to sell
E. L. Ramm Co., LaGrange, Illinois

CEMENT COLORS
Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 34 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages.
manufactured by
LANDERS-SEGAL COLOR CO.
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CHEAP FOR QUICK SALE
Multiplex Tamper, 2000—8"; 1000—4"; 500—6" Cast Pallets. 29 H.P. Scotch Marine Boiler with Ace Oil Burner, complete Automatic Controls, 2000 gal. Tank, 30' Stack. 12 cu. ft. Multiplex Mixer. 30 Ton Bin and Elevator. Truckman Lift Truck. All or any part.
IRWIN BLOCK & SUPPLY CO.
HOLLAND, OHIO

One Monarch Concrete Tile Machine. Will make Drain Tile from 5" to 18".
Two nearly new 7 ft. diameter Chase Mfg. Co.'s Turn Tables.
Ninety steel drying decks—have only been used two years. Will hold 72, 8"x8"x16" blocks. Will work with any block machine, making 3 blocks at a time, using cured pallets and hydraulic off bearer
One 14 ft. Blystone Stationary Mixer.
LAKE VIEW CONCRETE TILE COMPANY
LAKE VIEW, IOWA

ANTHRACITE CINDERS
A car load or a train load. Our supply is unlimited. Processed ready to use. Locations on Baltimore & Ohio, Pennsylvania, Lehigh Valley, and Reading Railroads. Call or write
ROY P. McMINDES COMPANY
105 Mace Avenue, Baltimore 21, Md.
Phone: Essex 179

PACKER-HEAD WINGS
Both McCracken Type and Martin Trowelers—PROVED to last as long or longer — yet cost considerably less. Write for prices.
TEXAS FOUNDRIES
LUFKIN, TEXAS

FOR SALE AT A BARGAIN
Good as new Kent Tamper stripper, motor driven, air stripper and feeder, hand takeoff. Attachments for making 4" and 8" blocks, also 1,000 aluminum pallets for both sizes. 25—48 block steel racks. Good condition. Vault forms for making 5 different sizes of triple seal vaults.
C. A. ROBERTS
Galien, Mich.

STOP *that* WATER
With FORMULA NO. 640
A clear liquid—7 different resins in a solvent which penetrates 1" or more into concrete, concrete blocks, stucco; seals, holds 1250 psf water pressure. Applies quickly—no mixing—no furring—no membrance—no cleanup. Use on forms—used or separate.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

FOR SALE
No. 7 Joltcrete with power carriage, air offbearer, automatic height control. Molds for 4", 6", 8" and 12", 3 core 45%. Flue and liner chimney molds, 600 chimney pallets.
64 steel racks and pallet oiler included.
RALPH E. GIBSON
133 E. South St. Carlisle, Penn.

UNBREAKABLE PALLET RINGS
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

FOR SALE
Crushed and sized cinder aggregate, tested and approved for the manufacture of cinder blocks. Write:
DULUTH CINDER, SLAG & STONE CO.
Box 116 Duluth 7, Minn.

FOR SALE
1—Appley "Little Giant" Block Machine; 1,000—8" pallets; 350—12" pallets; 700—4" pallets.
1—Vi-Brik-Cr-te-Vibrating Packerhead Brick Machine—7 bricks each.
TORRINGTON CEMENT PRODUCTS
Torrington, Wyoming

FOR SALE
1—18" Jeffrey Steel Apron Feeder 20' long, complete with drive. Good condition. $950.00
S. PROSSNER & SONS
Rome New York

WANTED
1 Fork Lift Truck, Gas
1 Platform Lift Truck, Gas
2 Pneumatic Offbearers
1 Large mixer, Gas or Diesel
1 Trough Conveyor, Mixer to Machine
1 Single deck, 24x72" Vibrating screen
Oval Core 50%, A.S. ⅝x⅝; pallets all sizes
60 or 72 Block Racks
Bloxham Building Block Company
Crystal Lake, Carbondale, Pa.
Phone 29R-3, Forest City, Pa.

FOR SALE
1 Stearns No. 7 Joltcrete with 4", 5" and 8" mold boxes and pallets
1 Stearns 28 cu. ft. batch mixer with 20 HP motor
1 Stearns 28 cu. ft. Skip Loader with motor
1 Champion drain tile machine (like new)
1 Hamburg Vertical 25 HP Boiler with stoker
CANNON BLOCK PLANT
SPARTANBURG, S. C.

One unused GoCorp Chimney attachment for GoCorp Jr. Block Machine. Makes round ventilated flue male and female chimney blocks. Flue diameter, 10¾ inches. Block 16x16 inches, six inches high. Pallets to go with all attachments, $2.00 each. Price of attachment, $550.00 Box J-27 CONCRETE PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Illinois

WANTED
No. 7 Joltcrete and other equipment required to manufacture about 3000 units per shift. Also flue attachments. Will buy separate items or as one unit. Will pay cash. Leon Ramella, 658 Stewart St., Welch, W. Va.

WANTED
1—FORK LIFT TRUCK—4000 LB. CAPACITY OR OVER
1—28 CU. FT. MIXER
IN REPLY STATE CONDITION AND PRICE
BOLTON BLOCK COMPANY
Johnson City, Tenn. Phone 30

WANTED
Used Besser Super Vibra-Pac, Stearns 50, Stearns 15, Lith-I-Block (2 or 3 block) or Go-Corp (2 or 3 block)
State Price, age and condition.
Write Box I-23, CONCRETE PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Ill.

WANTED
Besser Vibrapac block machine with or without mixer.
Address
Fire Proof Construction, Inc.
880 W. Third Ave. Columbus 8, Ohio

Save 8 man-hours every day

with truck-man!"

And that's not hay! That's what block plant operators across the country tell us they save with this economical, rugged truck. One man's time . . .every day . . . the whole year 'round . . . *that* adds up!

You save up to $300.00 and more during the first month you put Truck-Man to work in your block or brick yard . . . and you continue to save at that rate during years of faithful, dependable Truck-Man service.

Truck-Man is a light, speedy, highly maneuverable truck that works a shift on little more than a gallon of gas . . . requires minimum maintenance . . . has simple controls any worker quickly learns to operate. The special 62" platform handles even 72 block racks . . . those extra big loads that mean more profit per trip between block machine and curing room. Various platform heights, widths and lengths available to suit your operation.

There's an extra dividend for you, too, in the gentle treatment your blocks get. Truck-Man's easy hydraulic lift and drop, soft *start* and *stop*, and rubber-cushioned ride spot your racks gently . . . no costly checking of green blocks to eat up profits.

New 1950 catalog describes three low-cost Truck-Man models. You owe it to yourself to get the whole story on this money-maker. Coupon brings your copy, at no obligation. Mail it now. Sales and service in 95 centers across the nation!

truck-man Div. of The KNICKERBOCKER CO.
650 LIBERTY ST. • JACKSON, MICH.

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CITY _____ ZONE _____ STATE _____

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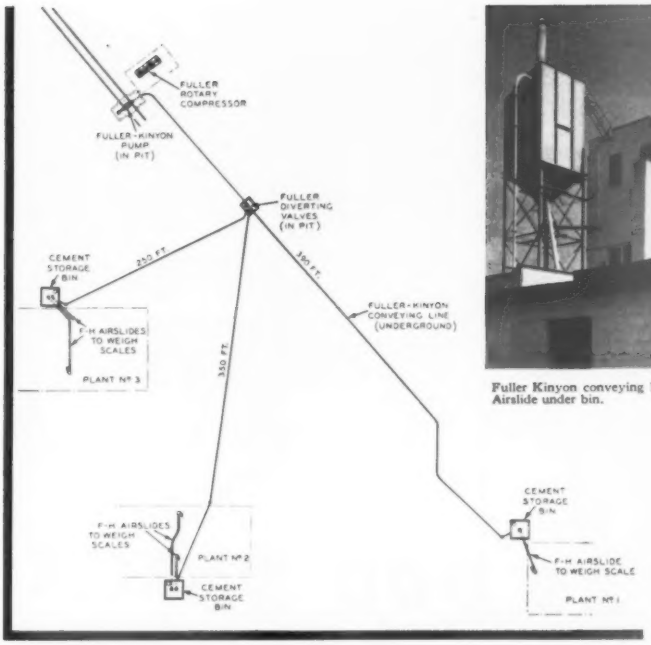
SURVEY AND STUDY BRING RESULTS



Fuller Kinyon conveying line entering storage bin. Airslide under bin.

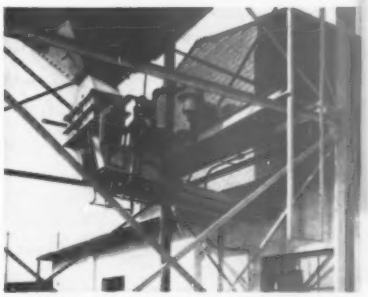
in Paturzo's Concrete-Block Plant

When the engineers of V. Paturzo, Bro. & Son, Inc., Baltimore, Maryland, needed conveying equipment for their large, modern concrete-block plant, they turned to Fuller for suggestions and aid in selecting the most efficient method for handling Portland cement. As a result of studies made, Paturzo has standardized on Fuller equipment wherever possible to do so.

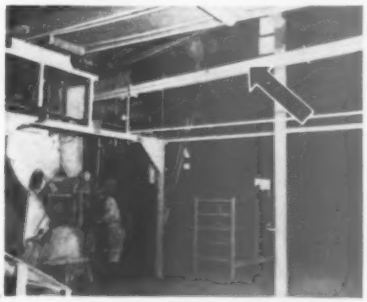
All cement, received in hopper-bottom cars, is conveyed by a Fuller-Kinyon Pump to storage bins in three different locations in the plant. This pump has a capacity of 200 barrels an hour.

And, they didn't stop there . . . they installed F-H Airslides underneath all the bins, for controlled conveying of cement to weigh scales over the mixers. These Airslides, equipped with F-H Airfeeders and F-H air motor-operated cut-off gates, above the scales, give them perfect control of each batch, in addition to clean operation and minimum power consumption.

Why not have our engineers make a survey of your conveying and submit their recommendations, based strictly upon your particular requirements. No obligation, of course.



Two Airslides and Airfeeders conveying from storage bin to weigh scales in plant.



Airslide delivering to weigh scale over mixer in plant.

G-64

Fuller

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS • COMPRESSORS AND VACUUM PUMPS FEEDERS AND ASSOCIATED EQUIPMENT

FULLER COMPANY
Catasauqua, Pennsylvania
Chicago 3—120 So. LaSalle St.
San Francisco 4—420 Chancery Bldg.

28,000 BRICKS in 8 hours!

WITH JACKSON & CHURCH MODEL APB ROTARY TABLE BRICK PRESS

Speed production . . . turn out brick that is uniformly even in texture, square and sharp-cornered!

Jackson & Church's 12 pocket Model APB Brick Press incorporates all the engineering features that insure large-scale manufacture of clean, strong brick. The unusually high forming pressure imparts a smooth, even surface to the brick, densely packing the aggregate to assure low absorption.

No pallets required, automatic feed control, mold depth regulator, automatic tablestop for removal of brick, and many other features assure top operating ease and efficiency with lowest operating and maintenance costs.

Write today for data and specifications.

If your production requires a machine of smaller capacity, use the J & C Model CPX 14,000 perfect bricks in 8 hours!

A PRODUCT OF

JACKSON & CHURCH CO. SAGINAW, MICHIGAN

WORK WELL DONE SINCE '81

COLUMBIA ROCK PRODUCTS, Columbia, Tennessee, uses a Pioneer 30" x 42" Jaw Crusher as a primary breaker for its completely equipped Pioneer plant. This company produces road rock, ballast and agricultural limestone.

THIS NEW ORE WASHING PLANT, located on the Mesabi Range near Hibbing, Minnesota, uses a Pioneer 30" x 42" Jaw Crusher. This is only one of many Pioneer Jaw Crusher installations in the mines.

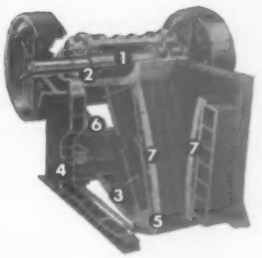
Gives larger rock a better break!

ARE you crushing limestone, flintrock, granite, or tough trap? There's a Pioneer Overhead Eccentric Jaw Crusher that will give your larger rocks a better break—deliver more tons per crusher dollar, with less maintenance per ton.

The huge opening on a Pioneer Jaw Crusher takes larger rocks with ease—saves man-hours and dynamite. For example, the Pioneer 30" x 42" Jaw Crusher operated by H. E. Sargent of Vasselboro, Maine, can handle the largest rock that will pass through the bucket of a two yard shovel. Sargent has crushed as much as 1600 tons in a 10 hour day!

Compared to other types of primary crushers of equal capacity, the Pioneer Overhead Eccentric Jaw Crusher sells for considerably less. In fact, dollar for dollar, a Pioneer Jaw Crusher outproduces any other type of primary crusher on the market today.

For more information on Pioneer crushing equipment, drop the coupon in the mail today. PIONEER ENGINEERING WORKS, 1515 Central Avenue, Minneapolis 13, Minnesota.



1. **OVERHEAD ECCENTRIC ACTION** forces material down and through as it is crushed, increasing capacity.
2. **EXCLUSIVE MOUNTING** places SKF bearings closer together than on any other anti-friction primary, reducing strain on the shaft.
3. **TOGGLE PLATE** holds lower end of the pitman at proper setting, and protects crusher from damage.
4. **DOUBLE-WALLED, WELDED STEEL BASE** combines rugged strength with light weight.
5. **MOVING JAW PLATE** has overhanging lip to protect cast steel pitman.
6. **FULLY ENCLOSED, DUST-TIGHT MECHANISM** affords quick, easy adjustment without shutdown.
7. **JAW PLATES** of manganese steel—reversible and shaped for maximum capacity and wear.

BUY BOTH!
Higher Output, Lower Upkeep!

Pioneer

Continuflo EQUIPMENT

PIONEER ENGINEERING WORKS
1515 Central Ave. • Minneapolis 13, Minn.

Please send me more information on the following:

- ☐ JAW CRUSHERS
- ☐ ROLL CRUSHERS
- ☐ CONVEYORS
- ☐ ROCK PLANTS
- ☐ VIBRATING SCREENS
- ☐ WASHING PLANTS
- ☐ APRON FEEDERS
- ☐ GRAVEL PLANTS
- ☐ TRAVELING GRIZZLY FEEDERS
- ☐ MECHANICAL FEEDERS
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Company_____

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WELLMAN *Williams Type*

FAST BUCKET OPENING SPEEDS OPERATIONS

• Double-hinge construction on Wellman's multiple-rope bucket permits faster opening than a single hinge. This speeds up operations, also gives a bigger spread in the open bucket for the same headroom.

Wellman's welded-design buckets offer you better performance and longer service. In all types and sizes you'll do better with Wellman!

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Write for free descriptive bulletins.

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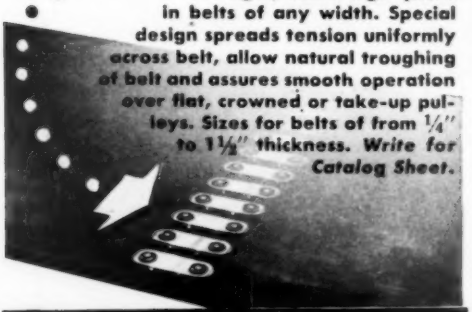

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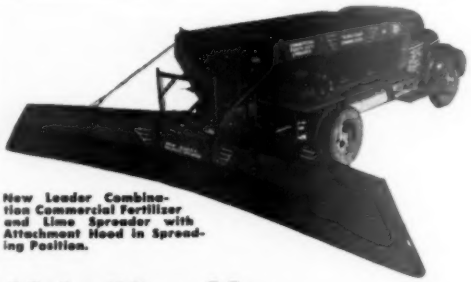

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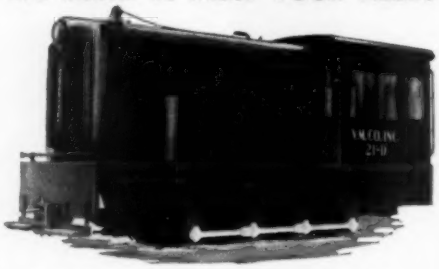

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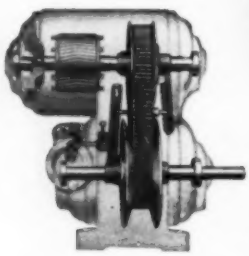

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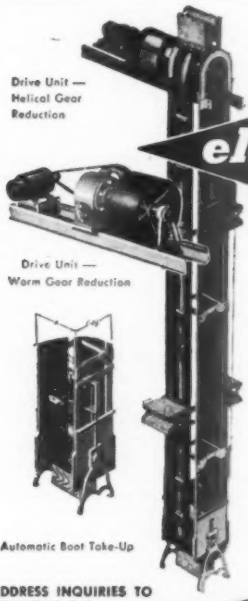

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10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
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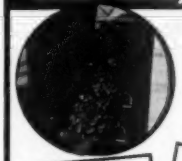

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Bucket Elevators, open and totally enclosed, new and used, as is or rebuilt.

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One 8' 0" Raymond Mechanical Air Separator, in good mechanical condition. Originally used to produce limestone minus 325 mesh. For further information contact:

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Cedarapids BBB scalping unit with 1036 jaw. Used 2 weeks.
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60-ton 2-compartment, 8'x18' storage bin with clamshell gates.
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1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

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1—Vacuum pump
1—Deck Hoist
Tug boat
Link Belt pan conveyor 36'x22' centers
Fuller clinker cooling equipment for 10' kiln
Chain and belt elevators
2—Clam shell buckets

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SHOVELS—CRANES—DRAGLINES

Lorain Model 820, 2 yd. Diesel Shovel.
Koehring 605 Diesel crane 1½ yd. Boom 20'.
Lima 604 Diesel crane 1½ yd. New 1948.
Lorain 80 Diesel Shovel 1¾ yds. Excellent.
Lima 1201, 2½ yd. Diesel Shovel.
Northwest 80D, 2½ yd. Diesel Shovel.
Manitowac model 3500 shovel-crane 2½ yds.
Bucyrus Erie 38 B shovel-crane 1¼ yds.
Link Belt K-595 dragline 2½ yds., 8 ft. boom. Diesel.

CRUSHERS

JAW: Acme 10x20, 14x26, 14x28, 10x42, 16x32, 18x32.
Cedar Rapids 20x36, 25x40, Farrell 10x20, 13x30, 14x36, 42x40, 42x60, 48x60. Buchanan 36x42, Type C 40x48. Good Roads Reliance 15x30. Traylor 18x36, 24x36, 60"x62". Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Champion 1030, 1040, 1236, 1530.
GYRATORY: Allis-Chalmers-McCully, 6" 7½", 8" 9", 12K, 20" 30" 14" Newhouse, 24", 36" Gyrasphere, 18", 28", Interstate Telsmith, Telsmith 5H, 10-B, 13-B, 16-B. Kennedy Van Saun 7, 19, 25½-S, 37, Traylor Ty 1'6", Ty 2'4", T-4½".
ROLL: Allis Chalmers 54x24, Diamond 40x22, Pioneer 30x18, Telsmith 24x16, McLanahan & Stone 18x42; 24"x18". New Holland 24x16.
HAMMER MILL: Kine & Williams Jumbo, Pennsylvania 8X2, 22x22, Cedar Rapids 20x33, Jeffrey 36x42, Jeffrey 36x24, 36x40 Dixie 3650.
BALL MILL: Allis Chalmers 4'x4', 5'6"x18', Kennedy Van Saun 7'x5', New 4'x4'; Hardinge 6'x4'; Colorado Iron Works 5'x6'; Marcy No. 64½.
ROD MILL: March 2'x6', 3'x6'. Allis Chalmers 4'x8', Hardinge No. R 206.
PULVERIZER: Williams 30 Slugger, Day Md. 70.
TUBE MILL: Smith 16B 5'6"x20'. Denver 3'x8'.
PEBBLE MILL: Hardinge conical, Abbe 6'x12'.
RAYMOND MILL: Low side 4 roller, No. 0 with dust collector; etc. complete.

TRANSIT MIXERS

2—REX 5¼ yd. borls. on LP. Macks. New 1947.
2—SMITH Hi-discharge 5½ to 7 yd. on LP. Macks. New 1949.
1—REX truck mixer, 4 yd. T7 No. 467, Mack 6BW.
1—JAEGER 4 yd. horizontal on Int. HB-12.
3—REX 5½ yd. horizontal separate engine driven.
1—SMITH MOBILE No. 5 Mixer Model 405.
1—REX 6 yd. agitator on Diamond T chassis.

SCREENS AND CLASSIFIERS

Acme 5'x12' Revolv. Scrub-Scalp Screen.
Niagara 2 deck 4'x10' vibrating screen.
Selecto 3 deck heavy duty type screen.
Pioneer 4'x10' Scalping Screen. New 1946.
Robins 4'x10' double deck.
Diamond 2 deck Mogul screen, 4'x12'.
Pioneer 4'x8' double deck.
Dorr 8'x26'8" Type DSD, 2'x15" Type SSFR and 3'x15' Type SDFR Classifiers.

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Sauerman Slack line 1 yd. complete with Jaeger Diesel hoist. Practically new.
Sauerman 1½ yd. 70' mast 150 HP Elec. Hoist.
Sauerman 1 yd. with Waukesha gas hoist.

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Cat. D6 Ser. 2U with bulldozer DDPCU.
Cat. D7 with bulldozer DDPCU.
Int. TD9 60" tread hyd. bulldozer.
Int. TD14 with hyd. bulldozer.
Int. TD18 74" tread with hyd. bulldozer.

AIR COMPRESSORS

C-P 500 CFM Diesel portable.
C-P 500 CFM stationary 75 HP motor.
I-R 500 CFM Diesel portable.
Sullivan 210 CFM Diesel portable.

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Blaw-Knox 3 compt. 200 ton ag. bin and 800 bbls. cement bins with 3 yd. batcher.
Blaw-Knox complete with two 3 yd. transit mixers.
B-K 110 bbl. cement bin with automatic scale.
Streator portable 60 yds. concrete mix per hour.
Johnson 1575 Bbls. cement silo, screw and elevator.
Johnson 180 tons, 4 compt. aggregate, 4 yd. concentric batcher, cement silo 888 barrels.
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Barber-Greene 830-840 Hot Mix Plant.
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Cedar Rapids Model B Asphalt Plant Complete.
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Cedar Rapids Pitmaster crushing and screening.
Cedar Rapids Two Unit Mobile Crushing.
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Morris 10" elec. with cutter. Steel hull—49'x9'x5', Ellicott 8" with cutter, Diesel Hull 48'x18'x3'6".
8" Hydraulic, Diesel. On 32'x8' steel pontoons. Practically new.
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American 50 ton stiff leg derrick 100' Boom.
Custom built 15-ton stiff leg 110' Boom.
Lambert 25 ton Guy derrick 115' bm.
American Terry 20 ton Guy Derrick 100' bm.
American Terry 20 ton stiff leg with hoist.
American 25 ton stiff leg derrick 90' boom.
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New Buda diesel engine—New tracks—Entire truck assembly completely rebuilt, Upper deck including drum assemblies, swing assemblies, crowd and propel assemblies, boom assemblies as well as boom hoist, fairlead and boom HAD ALL WORN PARTS REPLACED. It couldn't be "nearer new" and still be a used machine!

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1—9 groove, 15⅝" diam.—2-7/16 bore
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32"x65' stainless steel, complete.

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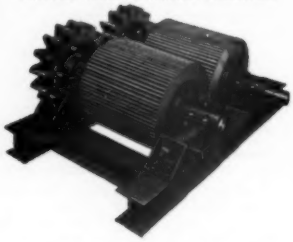

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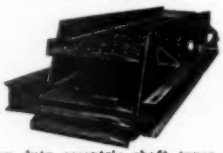

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1—4' TY-Traylor Reduction, Crusher, 10" feed opening, Serial 37140, 31" P.D. 14-D groove pulley and D-315 drive belts, new 1941, As is F.O.B. cars, Greene, N. D., April 1, 1951 .....$12,000.00
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COMPLETE UNIT
CEDAR RAPIDS
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Junior Tandem, Serial No. 11752, Complete with 6031C GM Diesel Motor, 10"x36" Jaw, Roll 24"x16", 23 Yard Bin, 136' Belt $31,000.00
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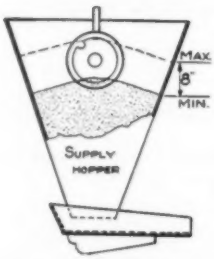

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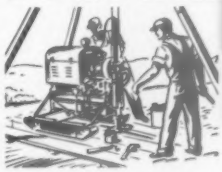

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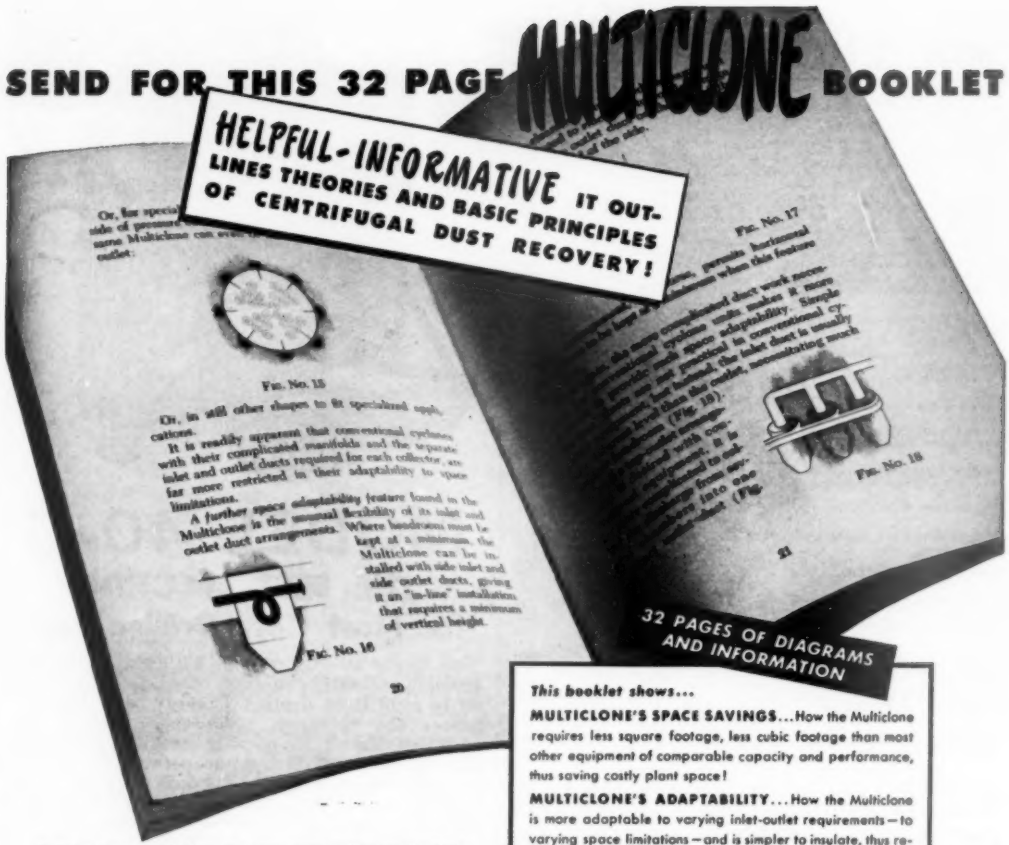

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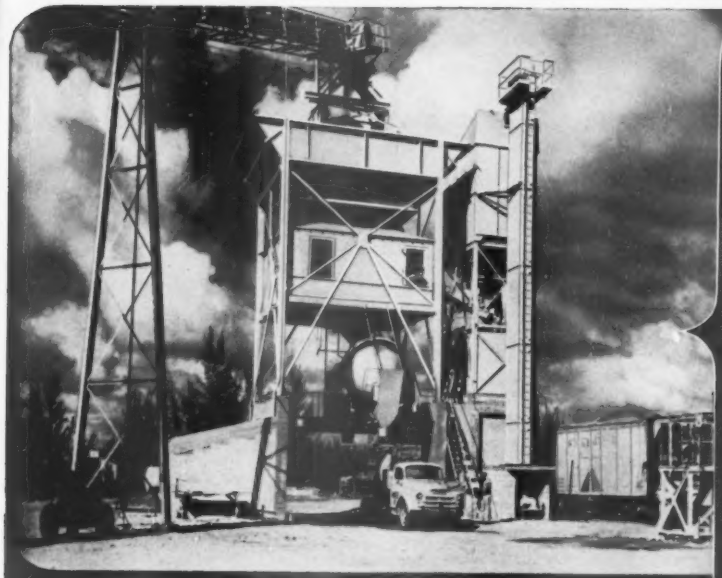

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